TABLE 2.—SAMPLING PLAN CODE FOR LETTER "A"—CONTINUED

[Sample Inspection Criteria]

Stage	Pass No.	Fail No.
19	8	13
20	8	13
21	9	14
22	10	14
23	10	15
24	11	15
25	11	16
26	12	16
27	12	17
28	13	17
29	14	17
30	15	17

[1] Test sample passing not permitted at this stage.
[2] Test sample failure not permitted at this stage.

TABLE 3.—SAMPLING PLAN FOR CODE LETTER "B"

[Sample Inspection Criteria]

Stage	Pass No.	Fail No.
1	([1])	([2])
2	([1])	([2])
3	([1])	([2])
4	([1])	([2])
5	0	([2])
6	1	6
7	1	7
8	2	7
9	2	8
10	3	8
11	3	9
12	4	9
13	4	10
14	5	10
15	5	11
16	6	12
17	6	12
18	7	13
19	8	13
20	8	14
21	9	14
22	9	15
23	10	15
24	10	16
25	11	16
26	11	17
27	12	17
28	12	18
29	13	18
30	13	19
31	14	19
32	14	20
33	15	20
34	16	21
35	16	21
36	17	22
37	17	22
38	18	22
39	18	22
40	21	22

[1] Test sample passing not permitted at this stage.
[2] Test sample failure not permitted at this stage.

TABLE 4.—SAMPLING PLAN FOR CODE LETTER "C"

[Sample Inspection Criteria]

Stage	Pass No.	Fail No.
1	[1]	[2]
2	[1]	[2]
3	[1]	[2]
4	[1]	[2]
5	0	[2]
6	0	6
7	1	7
8	2	7
9	2	8
10	3	9
11	3	9
12	4	10
13	4	10
14	5	11
15	5	11
16	6	12
17	6	12
18	7	13
19	7	13
20	8	14
21	8	14
22	9	15
23	10	15
24	10	16
25	11	16
26	11	17
27	12	17
28	12	18
29	13	18
30	13	19
31	14	19
32	14	20
33	15	20
34	15	21
35	16	21
36	16	22
37	17	22
38	17	23
39	18	23
40	19	24
41	19	24
42	20	25
43	20	25
44	21	26
45	21	27
46	22	27
47	22	27
48	23	27
49	23	27
50	26	27

[1] Test sample passing not permitted at this stage.
[2] Test sample failure not permitted at this stage.

TABLE 5.—SAMPLING PLAN FOR CODE LETTER "D"

[Sample Inspection Criteria]

Stage	Pass No.	Fail No.
1	([1])	([2])
2	([1])	([2])
3	([1])	([2])
4	([1])	([2])
5	0	([2])
6	0	6
7	1	7

TABLE 5.—SAMPLING PLAN FOR CODE LETTER "D"—Continued

[Sample Inspection Criteria]

Stage	Pass No.	Fail No.
8	2	8
9	2	8
10	3	9
11	3	9
12	4	10
13	4	10
14	5	11
15	5	11
16	6	12
17	6	12
18	7	13
19	7	13
20	8	14
21	8	14
22	9	15
23	9	15
24	10	16
25	11	16
26	11	17
27	12	17
28	12	18
29	13	19
30	13	19
31	14	20
32	14	20
33	15	21
34	15	21
35	16	22
36	16	22
37	17	23
38	17	23
39	18	24
40	18	24
41	19	25
42	19	26
43	20	26
44	21	27
45	21	27
46	22	28
47	22	28
48	23	29
49	23	29
50	24	30
51	24	30
52	25	31
53	25	31
54	26	32
55	26	32
56	27	33
57	27	33
58	28	33
59	28	33
60	32	33

[1] Test sample passing not permitted at this stage.
[2] Test sample failure not permitted at this stage.

[FR Doc. 83-196 Filed 1-11-83; 8:45 am]
BILLING CODE 6560-50-M

federal register

Wednesday
January 12, 1983

Part III

Environmental Protection Agency

High-Altitude Emission Standards for 1984 and Later Model Year Light-Duty Trucks; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 86

[AMS-FRL 2226-5]

Control of Air Pollution From New Motor Vehicles and New Motor Vehicle Engines; High-Altitude Emission Standards for 1984 and Later Model Year Light-Duty Trucks

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This action establishes mandatory emission standards for 1984 and later model year light-duty trucks (LDTs) sold for principal use at altitudes above 4,000 feet. The standards apply to exhaust emissions of hydrocarbons (HC), carbon monoxide (CO), and nitrogen oxides (NO_x). In addition, a standard for evaporative HC emissions is also being promulgated. The standards contained in this regulation continue the proportional relationship between high-altitude standards and low-altitude standards that was established by the 1982–83 interim standards (45 FR 66984). A voluntary high-altitude program for 1984 model year LDTs, which was mistakenly included in a separate final rulemaking (45 FR 63734), is also being deleted in this final rule.

This action indefinitely extends both the current self-certification provision and the performance-based exemption from the high-altitude certification requirements for LDTs. The current optional sales-based exemption is also being extended, but only for 1984. Comments are specifically requested on the need for extending the sales-based exemption beyond 1984 and also on the appropriateness of the performance-based exemption criteria. Further, EPA is continuing its policy of foregoing high-altitude Selective Enforcement Audit (SEA) testing.

This regulation is expected to provide up to a 2 percent improvement in the ambient air quality of major high-altitude urban areas. These standards are also expected to add $9 to the purchase price of an average high-altitude LDT.

EFFECTIVE DATE: These regulations are effective as of February 11, 1983.

ADDRESSES: Copies of the material relevant to this rulemaking are contained in Public Docket No. A-79-14 at the U.S. Environmental Protection Agency, Central Docket Section. The docket is located in West Tower Lobby, Gallery 1, 401 M. Street, SW., Washington, D.C. 20460, telephone number (202) 755-0240. The docket may be inspected between 8:00 a.m. and 4:00 p.m. on weekdays. A reasonable fee may be charged for copying services.

FOR FURTHER INFORMATION CONTACT: Mr. Daniel P. Heiser, Emission Control Technology Division, U.S. Environmental Protection Agency, 2565 Plymouth Road, Ann Arbor, MI 48105, (313) 668-4274.

SUPPLEMENTARY INFORMATION: OMB Control Number 2000-0390.

I. Background

These rules establish high-altitude emission standards for 1984 and later LDTs that, with few exceptions, represent essentially a continuation of the approach followed for the current 1982–83 high-altitude emission control program. As such, the most effective way to gain a basic understanding of the high-altitude emission control program for 1984 and later is by briefly reviewing EPA's current emission control regulations for high-altitude LDTs. It will also be helpful to explore both the special air quality problems associated with high-altitude areas and the history which has led to the promulgation of these 1984 high-altitude regulations. Once this background information has been presented, the specific components of this rulemaking action will be described in greater detail.

A. Need for High-Altitude LDT Standards

EPA has found that light-duty motor vehicles which demonstrate compliance with only low-altitude emission standards generally produce about 50 percent more exhaust hydrocarbons (HC) and 100 percent more carbon monoxide (CO) when tested at 5,300 feet above sea level. Also, in most high-altitude urban areas, motor vehicles account for more than half of the total HC emissions and almost all of the CO emissions. The HC emissions in the presence of summer sunlight contribute to numerous violations of the National Ambient Air Quality Standards (NAAQS) for oxidant in high-altitude metropolitan areas. Similarly, CO emissions in stable winter atmospheric conditions cause numerous violations of the NAAQS for CO. Although progress is being made in reducing the severity of air pollution episodes in these metropolitan areas, specifically controlling emissions from high-altitude motor vehicles (including 1984 and later LDTs) is needed to help assure that the NAAQS for ozone and CO are attained and maintained in the future.

B. Current High-Altitude LDT Program

Mandatory high-altitude emission standards for 1982–83 light-duty motor vehicles were proposed on January 24, 1980 (45 FR 5988), under EPA's general rulemaking authority contained in section 202(a) of the Clean Air Act ("the Act"). These rules are consistent with the guidelines for such standards that were established by Congress in section 202(f) of the Act. The 1980 proposal included different sets of high-altitude standards for 1982 and 1983 light-duty trucks, because at that time EPA anticipated promulgating more stringent low-altitude LDT standards for the 1983 model year. Those more stringent standards were subsequently deferred for a year. Accordingly, the final regulations for high-altitude LDTs, promulgated on October 8, 1980 (45 FR 66984), contained a single set of standards for the 1982 and 1983 model years, based upon the less stringent low-altitude standards applicable in those years. Today's action promulgates for 1984 and later model years the more stringent LDT standards originally proposed for the 1983 model year.

The 1982–83 high-altitude HC and CO standards require the same percentage reduction from uncontrolled emissions at high altitude (about 5,300 feet) as that achieved by the associated low-altitude standards. These standards, therefore, are termed "proportional." For NO_x emissions, which decrease from uncontrolled vehicles as altitude increases, section 202(f) effectively limits the high-altitude standard to the same numerical level as the low-altitude standard. (Even though the NO_x standard does not require that this pollutant be "proportionally" controlled at an elevation of 5,300 feet as do the HC and CO standards, all these standards are collectively referred to as "proportional standards" for convenience.) A general result of this control strategy is that proportional high-altitude standards are no more difficult to meet than the standards at low altitude.

The regulations which implement the current high-altitude standards were carefully designed to maximize model availability in high-altitude areas (a problem with EPA's 1977 high-altitude regulations), while at the same time minimizing the cost of the regulations and avoiding any adverse impact on the low-altitude fleet. There are three primary components of the regulations which provide these desired results. First, in order to market a vehicle anywhere in the nation, the regulations require that the vehicle must either automatically meet both the low- and high-altitude standards, or be capable of being modified to do so. This protects model availability at high altitude since manufacturers must invest the required time and money to certify LDTs to the high-altitude standards in order to sell these vehicles at low altitude. Once these resources are expended, manufacturers are likely to sell such vehicles at high altitude to recover their investment. Also, by allowing vehicles to be modified in compliance with the standards, the cost of these regulations to the nation is minimized since high-altitude emission control hardware is required only on those vehicles sold in high-altitude areas. However, the regulations generally restrict any required changes to engine operating parameters such as the air/fuel ratio of the carburetor so that vehicle modifications are not excessively expensive.

Second, manufacturers have the option of certifying vehicles to high-altitude standards at 5,300 feet by either: (1) Utilizing full vehicle tests in conjunction with Federally established procedures, or (2) by submitting a statement to EPA that engineering evaluations, based on whatever test data the manufacturer deems appropriate, were used to determine compliance. This latter provision is generally referred to as self-certification and was introduced into the regulations on April 23, 1981 (46 FR 23053), to ease certification leadtime constraints for 1982 model year vehicles. The provision was continued for 1983 model year vehicles to minimize the potential for confusion which might result from having completely different certification requirements in 1982 than in 1983, and also to reduce the cost burden of high-altitude standards on the economically depressed automotive industry.

Third, exemptions from the high-altitude certification requirements discussed above are provided for certain LDTs to prevent some light truck configurations from being removed from both the low- and high-altitude markets for failure to comply with high-altitude standards. This result is possible because, in the absence of exemptions, failure to certify to both low- and high-altitude standards precludes selling the affected vehicle anywhere in the nation.

At the time the high-altitude standards were promulated on October 8, 1980, EPA found that different exemption schemes were needed for the 1982 and 1983 model years. For 1982, manufacturers were allowed to exempt up to 30 percent of their projected high-altitude sales from the certification requirements to counter the short leadtime that was provided by the regulations. These exempted vehicles were allowed to be sold for principal use in high-altitude areas in order to prevent model availability problems at elevations above 4,000 feet. This provision is referred to as a sales-based exemption.

For 1983, EPA implemented a performance-based exemption. This provision uses objective performance criteria to identify low power, high fuel economy vehicles which are very difficult to modify properly to comply with high-altitude standards, and which are normally sold in only small numbers at high altitude anyway because of their inferior performance under high-altitude conditions. Performance-exempted vehicles may not be sold for principal use above 4,000 feet to maximize the environmental benefits of the regulations. This exemption removes the potential of adversely affecting national fuel economy and does not significantly affect high-altitude model availability.

On May 20, 1982 (47 FR 21793), EPA granted a petition by Ford Motor Company to extend the sales-based exemption into the 1983 model year. This provided manufacturers with the option of either exempting 30 percent of their projected high-altitude LDT sales, or exempting only low power LDTs with the existing performance-based provision.

A voluntary high-altitude program for 1984 model year LDTs was mistakenly included in the final rule on low-altitude standards for 1984 and later light trucks (45 FR 63734). The standards in this voluntary program are the same as the mandatory 1982–83 high-altitude standards and, hence, are not proportional to the new, more stringent low-altitude standards which are effective beginning in 1984. This voluntary high-altitude program is being deleted in this final rulemaking by promulgating mandatory proportional standards for 1984 LDTs.

C. History of the High-Altitude Rule

All of the proportional high-altitude standards are being promulgated in this final rulemaking, even those that are not changing, because existing standards for LDTs expire after the 1983 model year. As noted above, these standards were proposed on January 24, 1980 for the 1983 model year, and were subsequently commented upon by interested parties. Nevertheless, these proportional standards were never finalized because the new low-altitude LDT standards upon which they were based were eventually postponed until 1984. Therefore, the high-altitude emission standards that are being promulgated in this final rulemaking will retain the "proportional" nature of the low- to high-altitude standards as previously proposed and commented upon.

Also, in the ensuing time since the high-altitude standards were proposed, EPA's intent to continue proportional high-altitude standards for 1984 and later years was clearly stated during EPA/Industry meetings held at the Motor Vehicle Emissions Laboratory in Ann Arbor, Michigan. In addition, a continuation of proportional standards was supported by a Special Task Force to the President which examined the economic problems of the U.S. automotive industry.[1] They recommended that Congress "* * * preserv[e] EPA's [already existing] authority to require proportional standards for light * * * trucks * * *" sold at high altitude into the 1984 model year and beyond. Therefore, the automotive industry has been expecting these new proportional standards for some time.

[1] "Actions to Help the U.S. Auto Industry," The White House, Office of the Press Secretary, April 6, 1981.

II. Specific Components of This Package and Major Issues

A. Standards

The standards contained in this rulemaking apply to the exhaust emissions of HC, CO, and NO_x, and to the evaporative emissions of HC. The exhaust emission standards are 1.0 gram per mile (g/mi) HC, 14 g/mi CO, 2.3 g/mi NO_x. The evaporative HC standard is 2.6 g/test. The HC and CO high-altitude standards are being implemented to retain the current proportional emission control program when the corresponding standards at low altitude become more stringent beginning in 1984. Both the NO_x and evaporative HC emission standards remain unchanged from the 1983 model year values, however, since the corresponding low-altitude standards are not changing in 1984.

A detailed derivation of the 1.0 g/mi HC and 14 g/mi CO proportional high-altitude standards was presented in the proposal of these standards (45 FR 5988). In summary, these standards were derived by multiplying the low-altitude LDT standard of 0.8 g/mi HC and 10 g/mi CO by "proportional factors" of 1.2 for HC and 1.4 for CO. These proportional factors represent the ratio of uncontrolled emissions at high altitude to those at low altitude, and were derived from emission tests conducted on a fleet of 1970 vehicles as specified in section 202(f) of the Act.

The low- and high-altitude standards are summarized in Table 1. This table also contains the low-altitude standards for comparison.

TABLE 1.—LOW- AND HIGH-ALTITUDE STANDARDS FOR 1984 AND LATER LDTS

Altitude	HC[1]	CO[1]	NO_x[1]	Evap HC[2]
Low	0.8	10	2.3	2.0
High	1.0	14	2.3	2.6

[1] Grams/mile.
[2] Grams/test.

No particulate standard is being established at this time for diesel-powered LDTs sold in high-altitude areas. There are three reasons for this. First, particulate standards were not included in the interim high-altitude program (1982–83). Second, a particulate standard for high-altitude LDTs has never been proposed nor has the public had a chance to comment on such a standard. Third, EPA is still in the process of analyzing the feasibility of, need for, and impact of proportional diesel particulate standards at high altitude and has not yet decided on what action, if any, would be appropriate. If EPA decides that a particulate standard is appropriate for LDTs at high altitude, that decision would be announced in a Notice of Proposed Rulemaking and the public would be given ample opportunity to comment on a proposed standard.

B. Exemptions

As previously stated, exemptions from the high-altitude certification requirements were made available during the 1982–83 model years primarily to ensure that the high-altitude standards did not adversely affect model availability at low altitude and also to reduce the burden of these standards on manufacturers without significantly affecting model availability at high altitude. Since this action continues the proportional nature of the earlier standards, and hence, is similar in its emission control requirements (this is discussed in greater detail later), the need for some form of exemptions remains unchanged for the 1984 and later model years. Therefore, exemptions from the high-altitude requirements are included in this rulemaking.

The current performance-based exemption is being extended for 1984 and later LDTs. This exemption scheme preserves the environmental benefit of the regulation since only LDTs which meet proportional standards may be sold for principal use in high-altitude areas. At the same time, the cost of the regulation is significantly reduced by exempting low power vehicles which are the most difficult and costly to control at high altitude. The performance exemption also has little adverse impact on model availability at high altitude because exemptions are available only for low-power vehicles. Even in the absence of high-altitude regulations, these vehicles would be sold in only small numbers in areas above 4,000 feet by virtue of their inherently inferior performance at higher elevations.

The Agency had previously stated that the 30 percent sales-based exemption would not be extended into 1984. This intent was stated in the rulemaking that promulgated the sales-based exemption for 1983 as an option to the performance-based exemption which was already available in that year (45 FR 21293). Nevertheless, the Agency now finds it necessary to extend into 1984 the availability of the optional sales-based exemption provision for two principal reasons. First, while the leadtime for manufacturers to respond to new proportional standards is adequate with sales exemptions (as discussed in greater detail below), their absence could jeopardize completing certification in time for the normal introduction of 1984 LDTs. Potentially, manufacturers would have to develop and certify more LDT configurations (model/drivetrain combinations) if only performance-based exemptions were available in 1984 since many vehicle configurations were previously exempt in 1982 and 1983 under the optional 30 percent sales-based exemption. Developing calibrations for these previously exempted vehicles would likely require more leadtime than will be provided by this rulemaking action. Also, developing these new calibrations on such short notice could significantly increase the development cost of the 1984 standards at a time when the economically depressed industry must already comply with both new 1984 low- and high-altitude emission standards.

The second reason for extending the optional sales exemption for one more year is that the appropriateness of the performance-exemption criteria has been questioned by Ford Motor Company and, as a result, EPA solicited comments on the proper form of this provision in conjunction with the above-referenced rulemaking. The comment period on the performance-exemption criteria closed August 18, 1982, and EPA is continuing to evaluate the issues in light of the comments received. Unfortunately, there is inadequte time in which to resolve those issues fully in this action without jeopardizing the promulgation of LDT standards for 1984. Therefore, this issue is more properly addressed at a later time for the 1985 model year. In the interim, EPA is inviting additional comments from interested parties on the adequacy of the performance-exemption criteria so that all possible evidence can be considered by the Agency before a final decision is made on the need to revise this provision. At the same time, the Agency will also consider comments from interested parties on the need for and desirability of extending sales-based exemptions into future model years since EPA has not reached a final decision on whether continuation of this option is necessary for those years. Further information on the comment period for both the sales and performance exemption is provided in the Public Participation section.

C. High-Altitude Certification

The certification requirements for 1984 and later LDTs are unchanged from the requirements that are currently applicable to 1982 and 1983 vehicles. These certification requirements were amply described in the Background section of that preamble, and hence, there is no need to repeat that

discussion here. However, one aspect of high-altitude certification does deserve additional attention, i.e., self-certification. For 1984 and later, manufacturers will continue to have the option of self-certifying non-exempt LDTs at high altitude by submitting statements to EPA attesting that engineering evaluations, based on appropriate emissions test data, were used to determine compliance with the hight-altitude standards. This self-certification option is being continued so that the burden of complying with proportional standards does not significantly increase in 1984 from past years. This program should save the LDT industry a significant amount of money when compared to the costs of full certification at high-altitude, which would require expensive testing labs and expensive prototype vehicles for a relatively small percentage of a manufacturer's LDT sales. A self-certification program is therefore consistent with the President's goal of minimizing the costs of environmental regulations. Also, manufacturers should have the capability to evaluate high-altitude LDT emissions accurately without direct testing, since they have a valid emissions data base of LDTs certified at low altitude and can extrapolate this data to high-altitude conditions. More discussion on the development and appropriateness of the self-certification program for high altitude can be found in a previous rulemaking notice (46 FR 23053).

Although self-certification should accurately reflect the emissions of new LDTs, there is some concern of an increase in risk, when compared to full certification, that some LDTs will not be complying with high-altitude standards. However, non-exempt LDTs will still be liable for meeting applicable standards while in-use at high-altitude and EPA will also continue its emission factors program of testing in-use LDTs at high altitude. This should provide assurance that self-certification will not result in air quality degradation in areas above 4,000 feet. Thus, self-certification should be a more cost-effective approach for reducing emissions at high altitude than full certification.

D. Technological Feasibility

The technological feasibility of high altitude HC, CO, and NO_x standards is primarily dependent on the degree to which emissions must be reduced from a low-altitude vehicle when it is operated at high altitude. By retaining the proportional nature of the 1982–83 high altitude standards in the new 1984 high altitude standards, as previously discussed, EPA has also essentially retained the degree to which emissions must be controlled from a low-altitude vehicle at high altitude. Consequently, the technical feasibility of the new 1984 proportional standards is basically the same as that of the readily achievable 1982–83 proportional standards. This is especially true since LDT manufacturers are projecting the continued use of non-electronic (nonfeedback) emission control systems at low altitude.

This similarity in technical difficulty, therefore, will manifest itself in requiring essentially the same emission control hardware on 1984 LDTs as is currently required on 1982–83 LDTs. The majority of high-altitude LDTs will require carburetor modifications to produce leaner fuel/air mixtures, recalibration of existing adjustable parameters such as spark timing, and the addition of an aneroid (pressure-sensing device) to the carburetor to maintain performance when the vehicle is driven at low altitude by enriching the fuel/air mixture. Thus, the new 1984 proportional standards will not require any new emission control hardware, even though the standards are numerically more stringent, i.e., the numerical values for HC and CO are lower. The evaporative HC control technology will, of course, remain unchanged for 1984 since the level of the standard is unchanged.

The control hardware discussed above is the control technology EPA projected in the January 1980 Notice of Proposed Rulemaking would be required to meet these standards (45 FR 5988).[2] The comments received subsequent to that proposal supported the technological feasibility of the new proportional standards and no comments received since that time have challenged that finding.

E. Leadtime

The leadtime which is necessary for manufacturers to comply with high-altitude standards depends primarily on the technical complexity of the requirements. Discussions in the previous sections of this preamble have clearly shown that the technical complexity and, indeed, the control hardware, are essentially the same for both the 1982–83 proportional standards and the 1984 proportional standards. For these reasons, the best basis for determining whether or not adequate leadtime exists for implementing proportional standards for 1984 is to compare these requirements against past experience with similar requirements for the 1982 model year.

In promulgating the 1982–83 proportional standards, EPA allowed about nine months for manufacturers to develop, certify, and produce vehicles (November 1980 to August 1981). This was, admittedly, a shorter period of time than normally would be provided to respond to new emission standards. However, this leadtime was judged to be adequate since sales exemptions and, eventually, self-certification were included in the 1982 regulations to remove any jeopardy of not being able to conclude certification on time. The adequacy of the 9-month leadtime is now apparent from the fact that manufacturers' scheduled introduction dates for 1982 model year vehicles were not adversely affected. Based on this past experience with standards of equivalent technological complexity (i.e., similar control technology, sales-based exemptions, and self-certification), EPA concludes that adequate leadtime exists for implementing new proportional standards since at least nine months will be available between the promulgation of these rules and the normally scheduled production date for 1984 model year LDTs.

This conclusion is further supported in that manufacturers now have substantial experience in complying with the 1982–83 proportional standards and this experience should be useful in reducing the time which might otherwise be necessary to develop the required high-altitude engine calibrations for 1984. Also, manufacturers already may have begun to develop the necessary emission controls for 1984 since EPA has clearly stated the Agency's intent to promulgate new proportional standards over the past several months, as discussed previously. Therefore, EPA believes that the leadtime provided by this rulemaking action is adequate.

F. Economic Impact

The incremental cost of these regulations is due primarily to new development and certification cost.[3] While these regulations will require control hardware to be added to low altitude LDTs, this is essentially the same hardware already required by the

[2] Emission control hardware projections were presented in detail in the Draft Regulatory Analysis of the proposed standards which is available for review in the public docket.

[3] The economic impacts described herein are incremental to those associated with the current 1982–83 proportional high-altitude standards. However, it should be noted that not all of the costs associated with the 1982–83 standards continue beyond the 1983 model year. In particular, the development and certification costs associated with those standards were amortized over only two years in that rulemaking and do not apply to the 1984 model year and beyond (45 FR 86984).

1982 and 1983 regulations. Thus, the incremental cost due to hardware requirements should be zero. There also will be no incremental cost for Selective Enforcement Auditing (SEA) of high-altitude LDTs since the Agency will continue its present policy of no high-altitude SEA testing. This policy is consistent with statements made by the President's Special Task Force on the U.S. automotive industry [4] and was implemented by EPA on April 13, 1982 (46 FR 21628).

As discussed previously, LDTs must undergo recalibration due to the new proportional standards. Based on an analysis of the development costs in the 1982–83 interim program,[5] and assuming all LDT models require development, the total development cost would be about $3.2 million in 1984. For each succeeding year, development costs would only occur on new models being introduced, amounting to about $320,000 per year.

The above development costs are likely to be overestimated for three principal reasons. First, the self-certification provision included in these regulations will significantly reduce the cost of development from that originally projected in the 1982–83 interim program, which served as the basis for the estimates. The economic impact analysis of the interim program assumed "full" certification would be in effect. This would have required vehicle calibrations to be developed using actual vehicle tests in order to demonstrate compliance with the high-altitude standards at the time of certification. Many of these expensive vehicle tests will be eliminated if manufacturers take advantage of the self-certification provision, which relies predominantly on engineering evaluations to determine compliance with the standards. Second, all LDT engine families will not require development due to this regulation since approximately 30 percent of the LDT engine families will be exempted from meeting the new proportional standards, at least for the 1984 model year. Third, many families would have required new calibrations even without the new proportional standards because of changes in the low-altitude emission standards.

In addition to development, manufacturers of LDTs must also certify vehicles for 1984. The total cost of certification for high-altitude LDTs will be approximately $120,000 for 1984. For each year after 1984, certification will occur only for new models and will cost about $120,000 per year. Referring back to the above discussion, these costs are likely to be overestimated since they are based on the estimates contained in EPA's analysis of the interim high-altitude program, which assumed full certification, and do not reflect the potential savings due to self-certification.

Thus, the cost of these regulations in 1984 is estimated to be at most about $3.2 million. After 1984, the cost will decrease to about $320,000 per year. The total cost of these regulations to the nation during the first 5 years is conservatively estimated at about $4.4 million (discounted at 10 percent to 1984). Expressed differently, if these costs are amortized over the number of high-altitude LDTs sold during the first 5 years of the regulations, the average cost increase per high-altitude LDT will be no more than about $9. The potential fuel economy savings of the 1982 and 1983 high-altitude standards should remain unchanged in 1984 and later years as a result of these standards.

The economic impact of complying with these new proportional high-altitude LDT standards was also analyzed in the proposed rulemaking for the 1982–83 high-altitude standards (45 FR 5988). Generally larger costs were estimated at that time compared to those described above, because EPA originally projected that more expensive control technology would be required by some LDTs. However, even with those somewhat higher costs, EPA also concluded at that time that there would be no significant adverse economic impacts for LDT manufacturers, high-altitude dealerships, or vehicle purchasers. Thus, the same conclusion should hold for this rulemaking with its lower cost. It is true that the economic condition of the LDT industry has changed since the time of the original analyses. However, a cost of $9 per LDT sold at high altitude is very small compared to the total cost of the vehicle and would be very unlikely to affect sales or profits on high-altitude LDTs significantly.

G. Air Quality

These standards would reduce HC emissions by 20 percent or 0.05 tons and CO emissions by 40 percent or 1.45 tons compared to no high altitude control over the lifetime of each 1984 and later LDT. Over a 5-year sales period, the LDT lifetime reductions would be 23,800 tons HC and 690,000 tons of CO in high-altitude areas. These incremental reductions compare favorably with the original reductions associated with the 1982–83 high-altitude LDT regulations.

These emission reductions will result in improved air quality. An analysis of the ambient CO concentrations from 1986 to 1995 in selected high-altitude cities shows a reduction of up to 2 percent in expected second highest 8-hour CO concentrations from the 1979 base year. An analysis of ambient ozone concentrations shows that from 1986 to 1995, up to a 1 percent reduction can be expected in the maximum 1-hour ozone concentrations from the 1979 base year. While small, these improvements are needed since some high-altitude areas have significant air quality problems.

H. Cost Effectiveness

Using the lifetime emission reductions of 0.045 metric tons HC and of 1.3 metric tons CO, and dividing the $9 cost evenly between HC and CO control, the cost effectiveness of these regulations is $100 per metric ton HC and $3 per metric ton CO. These cost-effectiveness values compare favorably to the cost-effectiveness values of the 1982–83 high-altitude LDT standards. They also compare very favorably with the cost effectiveness values of other emission control strategies, which range up to about $735 per metric ton HC and $70 per metric ton CO.

I. Alternatives

Two alternative control strategies to these 1984 high-altitude LDT standards were considered by the Agency: (1) eliminating high-altitude standards altogether for 1984 and later LDTs, and (2) continuing the 1982–83 standards into 1984 and later model years.

The first alternative would eliminate EPA's mandatory high-altitude program for 1984 and later LDTs (only voluntary performance adjustments would be left). However, the mandatory high-altitude program of emission standards was initiated because EPA found that motor vehicles which demonstrated compliance at low altitude generally produced 50 percent more HC and 100 percent more CO when tested at 500 feet above sea level. The Agency also found that in most high-altitude urban areas, motor vehicles accounted for more than half of the total HC emissions and almost all CO emissions. Given that a number of large high-altitude urban centers are still in violation of the National Ambient Air Quality Standards (NAAQS) for CO and ozone (of which HC is a precursor), cost effective control of HC and CO from motor vehicles still appears necessary. Therefore, the

[4] "Actions to Help the U.S. Auto Industry," The White House, Office of the Press Secretary, April 6, 1981.

[5] A detailed description of these development costs is provided in a memorandum to the record and in the Final Regulatory Analysis of the 1982–83 high-altitude program which is available for review in the public docket.

alternative of setting no standards and essentially eliminating the high-altitude LDT program would be inappropriate.

The second option considered was a continuation of the 1982–83 high-altitude standards into 1984 and beyond. Such a continuation would actually be a relaxation of the technical stringency of the current standards because the emission control capability of low-altitude LDTs will improve dramatically in 1984. In fact, due to the new 1984 low-altitude standards, some 1984 LDTs may be able to meet the 1982–83 high-altitude standards without any modifications and, overall, little emission reduction would occur from those requiring control. Nevertheless, many of the costs of high-altitude emission control would remain since high-altitude calibrations would still need to be developed, vehicles certified, and inventories maintained. Thus, under this approach, few emission reductions would be realized, while many costs of full proportional standards would still remain. The cost effectiveness of this approach should actually be worse than that of the full proportional standards, since much greater emission reductions can be obtained for a slight increase in cost. Given that further cost-effective emission reductions still appear to be needed, the option of continuing the current standards was rejected.

III. Description of Changes From Proposed Regulations

These final regulations for 1984 and later model year LDTs are in all substantive respects identical to the regulations proposed for the 1983 model year, with the exception of the exemption and self-certification provisions. Those provisions, which are described in detail above, are a continuation of provisions previously promulgated for 1983 model year light-duty trucks.

IV. Response to Comments

The comments received in response to the proposed regulations generally supported the Agency's approach, including the technological and economic feasibility of the proposed standards. No information available to EPA indicates that the proposed standards would not continue to be technologically feasible; in fact, the continuation of the sales exemption and self-certification provisions improve the projections of technological feasibility made at the time of proposal. In any event, a detailed response to the comments received appears in a separate document in the public docket for this action, entitled, "Summary and Analysis of Comments," and dated October, 1980. That document was prepared in support of the 1982–83 standards previously promulgated, but also contains an analysis of the comments relating to the provisions promulgated in today's final action.

V. Amendments to Current Regulations

These final regulations also amend the existing paragraph (a)(1)(iii)(H) of § 86.082–35 of Subpart A. This paragraph explains the labeling requirements for each LDT exempted from high-altitude certification because of poor performance at high-altitude. The paragraph incorrectly refers to specifications for sales-based exemptions of LDTs (§ 86.083–9(g)(2)) and should refer to criteria for performance exemptions (§ 86.083–9(g)(4)). This change was inadvertently omitted in the interim final rulemaking published on May 20, 1982 (45 FR 21793) which extended the LDT sales-based exemptions into the 1983 model year.

VI. Judicial Review

The final action taken today is nationally applicable. Under section 307(b)(1) of the Clean Air Act, judicial review may be sought only in the United States Court of Appeals for the District of Columbia Circuit. Petitions for judicial review must be filed on or before March 14, 1983.

Legal Authority

Statutory authority for this action is provided by section 202(a) and 301(a) of the Clean Air Act [42 U.S.C. 7521 and 7601]. Section 202(a)(1) of the Act provides, in part, that "* * * the Administrator shall by regulation prescribe * * * standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles * * * which may reasonably be anticipated to endanger the public health or welfare * * *." Section 202(a)(2) of the Act provides, in part, that "* * * any regulation prescribed under paragraph (1) * * * shall take effect after such period as the Administrator finds necessary to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period." Section 301(a) provides, in part, that "the Administrator is authorized to prescribe such regulations as are necessary to carry out his functions under this Act."

Although this is a final rule, EPA requests manufacturers and other interested persons to submit comments on the need to continue sales-based exemptions beyond the 1984 model year and on the appropriateness of the current performance-based exemption criteria. If, as a result of these comments, amendments to the regulations are needed, EPA will initiate the rulemaking process to implement the appropriate changes.

Please submit written comments to: United States Environmental Protection Agency, Central Docket Section (A–130), ATTN: Docket No. A–79–14, Waterside Mall, West Tower Lobby, Gallery I, 401 M Street SW, Washington, D.C. 20460.

The docket may be inspected between 8:00 am and 4:00 pm, Monday through Friday. A reasonable fee may be charged for copying service.

Administrative Designation

Under Executive Order 12291, EPA must judge whether a regulation is "major" and therefore subject to the requirement of a Regulatory Impact Analysis. This regulation is not major because it has an annual effect on the economy of less than $100 million and it involves no significant adverse effect on competition, productivity, investment, employment, or innovation.

This regulation was submitted to the Office of Management and Budget for review as required by Executive Order 12291.

Effect on Small Entities

The Regulatory Flexibility Act, 5 U.S.C. 601 et seq., requires that EPA certify regulations that do not have a significant impact on a substantial number of small entities. Small entities potentially affected by this regulation include the automobile dealerships selling LDTs in designated high-altitude areas. These dealerships could potentially be adversely affected in two days. One, the price of a LDT could increase to the point of reducing sales. Two, the availability of certain models could be eliminated, again reducing sales.

EPA has designed these regulations to ensure that neither situation will occur. The cost of these regulations has already been described and should be very close to that of the high-altitude regulations for 1982 and 1983 model year light-duty trucks, which are not currently causing any hardships. Also, the extension of the 30 percent sales exemption should easily ensure model availability. Therefore, I certify that this regulation does not have any significant impact on small entities.

Impacts on Reporting Requirements

Information collection requirements contained in this regulation have been approved by the Office of Management and Budget (OMB) under the provisions of the Paperwork Reduction Act of 1980

U.S.C. 3501 *et seq.* and have been assigned OMB control number 2000-0390.

List of Subjects in 40 CFR Part 86

Administrative practice and procedure, Labeling, Motor vehicle pollution, Reporting and recordkeeping requirements.

Dated: December 20, 1982.

Anne M. Gorsuch,

Administrator.

PART 86—[AMENDED]

For the reasons set forth in the preamble, Part 86 of Chapter I, Title 40 of the Code of Federal Regulations is amended as follows:

1. Section 86.082–35 is amended by revising paragraph (a)(1)(iii)(H) as follows:

§86.082–35 Labeling.

(a) * * *

(1) * * *

(iii) * * *

(H) A statement, if applicable, that the vehicle has been exempted from meeting the high-altitude gaseous emission standards as specified in § 86.082–8(g)(2) and § 86.083–9(g)(4) and that its unsatisfactory performance under high-altitude conditions make it unsuitable for principal use at high altitude.

* * * * *

2. Section 86.084–9 is amended by revising paragraph (a)(1) introductory text, (d), and (e), and adding paragraphs (f) and (g) as follows:

§ 86.084–9 Emission standards for 1984 and later model year light-duty trucks.

(a)(1) The standards set forth in paragraphs (a) through (c) of this section shall apply for trucks sold for principal use at other than a designated high-altitude location. Exhaust emissions from 1984 and later model year light-duty trucks shall not exceed:

* * * * *

(d)(1) Model year 1984 and later light-duty trucks sold for principal use at designated high-altitude locations shall be capable of meeting the following exhaust emission standards when tested under high-altitude conditions.

(i) *Hydrocarbons.* 1.0 grams per vehicle mile (0.62 grams per vehicle kilometer);

(ii) *Carbon Monoxide.* 14 grams per vehicle mile (8.7 grams per vehicle kilometer);

(iii) *Oxides of Nitrogen.* 2.3 grams per vehicle mile (1.43 grams per vehicle kilometer).

(2) The standards set forth in paragraph (d)(1)(i), (d)(1)(ii)(A), and (d)(1)(iii) of this section refer to the exhaust emitted over a driving schedule as set forth in Subpart B of this part and measured and calculated in accordance with those procedures.

(e)(1) Fuel evaporative emissions from 1984 and later model year gasoline-fueled light-duty trucks sold for principal use at a designated high-altitude location shall not exceed 2.6 grams per test when tested under high-altitude conditions.

(2) The standard set forth in paragraph (e)(1) of this section refers to a composite sample of the fuel evaporative emissions collected under the conditions set forth in Subpart B of this part and measured in accordance with those procedures.

(f) No crankcase emissions shall be discharged into the ambient atmosphere from any 1984 and later model year gasoline-fueled light-duty trucks sold for principal use at a designated high-altitude location.

(g)(1) Any light-duty truck that a manufacturer wishes to certify for sale at low altitude must be capable of meeting high-altitude emission standards (specified in paragraphs (d) through (f) of this section). The manufacturer may specify vehicle adjustments or modifications to allow the vehicle to meet high-altitude standards but these adjustments or modifications may not alter the vehicle's basic engine, inertia weight class, transmission configuration, and axle ratio.

(i) A manufacturer may certify unique configurations to meet the high-altitude standards but is not required to certify these vehicle configurations to meet the low-altitude standards.

(ii) Any adjustments or modifications that are recommended to be performed on vehicles to satisfy the requirements of paragraph (g)(1) of this section:

(A) Shall be capable of being effectively performed by commercial repair facilities.

(B) Must be included in the manufacturer's application for certification.

(2) The manufacturer may exempt 1984 model year light-duty trucks from high-altitude emission standards as set forth in paragraph (d) of this section. No specific justification for the exemption need be included in the application for certification. The exemptions may include up to 30 percent of the manufacturer's projected light-duty truck sales for principal use at designated high-altitude locations for the 1984 model year. For this purpose, the sales percentage will be based on sales projections for individual vehicle configurations to be exempted. Exemptions will cover individual vehicle configurations, or groups of vehicle configurations, as specified by the manufacturer.

(3) The sale of a vehicle for principal use at a designated high-altitude location that has been exempted as set forth in paragraph (g)(2) of this section will not be considered a violation of section 203(a)(1) of the Clean Air Act.

(4) Exemption for vehicles from the high-altitude emission standards as set forth in paragraph (d) of this section may be granted by the Administrator for vehicles that are expected to have unsatisfactory performance under high-altitude conditions. Such exemptions will be granted upon petition by the manufacturer that the vehicle falls within the definition of vehicles eligible for exemption. A vehicle shall be considered eligible for exemption if its design parameters (displacement-to-weight ratio (D/W) and engine speed-to-vehicle speed (N/V)) simultaneously fall within the exempted range for that manufacturer for that year. The exempted range is determined according to the following procedure:

(i) The manufacturer shall graphically display the D/W and N/V data of all vehicle configurations it will offer for the model year in question. The axis of the abscissa shall be D/W (where (D) is the engine displacement expressed in cubic centimeters and (W) is the equivalent vehicle test weight expressed in pounds), and the axis of the ordinate shall be N/V (where (N) is the crank shaft speed expressed in revolutions per minute and (V) is the vehicle speed expressed in miles per hour). At the manufacturer's option, either the 1:1 transmission gear ratio or the lowest numerical gear ratio available in the transmission will be used to determine N/V. The gear selection must be the same for all N/V data points on the manufacturer's graph. For each transmission/axle ratio combination, only the lowest N/V value shall be used in the graphical display.

(ii) The product line is then defined by the equation, $N/V = C(D/W)^{-0.9}$, where the constant, (C), is determined by the requirement that all the vehicle data points either fall on the line or lie to the upper right of the line as displayed on the graph.

(iii) The exemption line is then defined by the equation, $N/V = C(0.84\ D/W)^{-0.9}$, where the constant, (C), is the same as that found in paragraph (g)(4)(ii) of this section.

(iv) The exempted range includes all values of N/V and D/W which simultaneously fall to the lower left of the exemption line as drawn on the graph.

(5) No exemptions will be granted under paragraph (g)(4) of this section to any manufacturer that has exempted vehicle configurations as set forth in paragraph (g)(2) of this section.

(6) The sale of a vehicle for principal use at a designated high-altitude location that has been exempted as set forth in paragraph (g)(4) of this section will be considered a violation of section 203(a)(1) of the Clean Air Act.

3. Section 86.084–21 is amended by revising paragraphs (b)(2) and (b)(4)(ii)(C)(*5*) as follows:

§ 86.084–21 Application for certification.

* * * * *

(b) * * *

(2) Project U.S. sales data sufficient to enable the Administrator to select a test fleet representative of the vehicles (or engines) for which certification is requested. The sales data shall also include the altitude of intended sale for light-duty trucks.

* * * * *

(4) * * *

(ii) * * *

(C) * * *

(*5*)(*i*) A statement of recommended maintenance and procedures necessary to assure that the vehicles (or engines) covered by a certificate of conformity in operation conform to the regulations, and a description of the program for training of personnel for such maintenance, and the equipment required.

(*ii*) A description of vehicle adjustments or modifications necessary, if any, to assure that light-duty trucks covered by a certificate of conformity conform to the regulations while being operated at any altitude locations, and a statement of the altitude at which the adjustments or modifications apply.

* * * * *

4. Section 86.084–24 is amended by adding paragraph (b)(1)(v), redesignating and revising paragraphs (b)(1)(vii) (D) and (E) as (b)(1) (viii) and (ix), respectively, and adding paragraph (b)(1)(x) to read as follows:

§ 86.084–24 Test vehicles and engines.

* * * * *

(b) *Emission data*—(1) * * *

(v) For high-altitude exhaust emission compliance for each engine family, the manufacturer shall follow one of the following procedures:

(A) The manufacturer will select for testing under high-altitude conditions the vehicle expected to exhibit the highest emissions from the nonexempt vehicles selected in accordance with § 86.084–24(b)(1) (ii), (iii), and (iv) of this section or,

(B) In lieu of testing vehicles according to paragraph (b)(1)(v)(A) of this section, a manufacturer may provide a statement in its application for certification that, based on the manufacturer's engineering evaluation of such high-altitude emission testing as the manufacturer deems appropriate,

(*1*) [Reserved]

(*2*) That light-duty trucks sold for principal use at designated high-altitude locations comply with the high-altitude emission requirements and, that all other light-duty trucks sold at low altitude and not exempt under § 86.084–9(g)(2) are capable of being modified to meet high-altitude standards.

* * * * *

(viii) For high-altitude evaporative emission compliance for each evaporative emission family, the manufacturer shall follow one of the following procedures:

(A) The manufacturer will select for testing under high-altitude conditions the one nonexempt vehicle previously selected under paragraphs (b)(1)(vii) (B) or (C) of this section which is expected to have the highest level of evaporative emissions when operated at high altitude or

(B) In lieu of testing vehicles according to paragraph (b)(1)(viii)(A) of this section, a manufacturer may provide a statement in its application of certification that based on the manufacturer's engineering evaluation of such high-altitude emission testing as the manufacturer deems appropriate,

(*1*) [Reserved]

(*2*) That light-duty trucks sold for principal use at designated high-altitude locations comply with the high-altitude emission requirements and that all other light-duty trucks sold at low altitude and not exempt under § 86.084–9(g)(2) are capable of being modified to meet high-altitude standards.

(ix) Vehicles selected under paragraph (b)(1)(v)(A) of this section may be used to satisfy the requirements of (b)(1)(viii)(A) of this section.

(x) (Light-Duty Trucks Only) (A) The manufacturer may reconfigure any of the low-altitude emission-data vehicles to represent the vehicle configuration required to be tested at high altitude.

(B) The manufacturer is not required to test the reconfigured vehicle at low altitude.

* * * * *

5. Section 86.084–26 is amended by revising the heading and by adding paragraphs (b)(4)(i)(B), (b)(4)(i)(C), (b)(4)(i)(D), (b)(4)(ii)(B), and (b)(4)(ii)(C), (b)(4)(ii)(D) as follows:

§ 86.084–26 Mileage and service accumulation; emission requirements.

* * * * *

(b) * * *

(4) * * *

(i) * * *

(B) Emission tests for emission-data vehicle(s) selected for testing under § 86.084–24(b)(1)(v) or (b)(1)(viii) shall be conducted at the mileage at which the engine-system combination is stabilized for emission testing or at 6,436 kilometers (4,000 miles) under high-altitude conditions.

(C) Exhaust and evaporative emission tests for emission-data vehicle(s) selected for testing under § 86.084–24(b)(1) (ii), (iii), (iv)(A), or (vii)(B) shall be conducted at the mileage at which the engine-system combination is stabilized for emission testing or at the 6,436-kilometer (4,000-mile) test point under low-altitude conditions.

(D) For each engine family, the manufacturer will select one vehicle previously selected under § 86.084–24(b) (1) (ii) through (b) (1) (iv) to be tested under high-altitude conditions. If the manufacturer recommends adjustments or modifications in order to conform to emission standards at high altitude, such adjustments or modifications shall be made to the test vehicle (in accordance with the instructions to be provided to the ultimate purchaser) before being tested under high-altitude conditions.

(ii) * * *

(B) Emission tests for emission-data vehicle(s) selected for testing under § 86.084–24(b) (1) (v) shall be conducted at the mileage at which the engine-system combination is stabilized for emission testing or at the 6,436-kilometer (4,000-mile) test point under low-altitude conditions.

(C) Exhaust and evaporative emission tests for emission-data vehicle(s) selected for testing under § 86.084–24(b) (1) (ii), (iii), and (iv) shall be conducted at the mileage at which the engine-system combination is stabilized for emission testing or at the 6,436-kilometer (4,000-mile) test point under low-altitude conditions.

(D) For each engine family, the manufacturer will select one vehicle previously selected under § 86.084–24(b) (1) (ii) through (b) (1) (iv) to be tested under high-altitude conditions. If the manufacturer recommends adjustments or modifications in order to conform to emission standards at high altitude, such adjustments or modifications shall be made to the test vehicle (in accordance with the instructions to be provided to the ultimate purchaser) before being tested under high-altitude conditions.

* * * * *

6. Section 86.084–30 is amended by revising paragraphs (a)(3), (a)(4), (a)(5), (b)(1)(ii)(D), and (b)(1)(ii)(E) as follows:

§ 86.084–30 Certification.

(a) * * *

(3) One such certificate will be issued for each engine family. For gasoline-fueled light-duty vehicles and light-duty trucks, one such certificate will be issued for each engine family-evaporative emission family combination.

(i) *Light-Duty Vehicles.* Each certificate will certify compliance with no more than one set of standards.

(ii) *Light-Duty Trucks.* Each certification will certify compliance with no more than one set of standards except for low-altitude standards and high-altitude standards. The certificate shall state that it covers vehicles sold or delivered to an ultimate purchaser for principal use at a designated high-altitude location only if the vehicle conforms in all material respects to the design specifications that apply to those vehicles described in the application for certification at high altitude.

(4) The adjustment or modification of any light-duty truck in accordance with instructions provided by the manufacturer for the altitude where the vehicle is principally used will not be considered violation of Section 203(a)(3) of the Clean Air Act. A violation of Section 203(a)(1) of the Clean Air Act occurs when any manufacturer sells or delivers to an ultimate purchaser any light-duty truck, subject to the regulations under the Act, which is not configured to meet high-altitude requirements:

(i) At a designated high-altitude location, unless such manufacturer has substantial reason to believe that such motor vehicle will not be used principally at a designated high-altitude location; or

(ii) At an other than designated high-altitude location, when such manufacturer has reason to believe that such motor vehicle will be used principally at a designated high-altitude location.

(5) For the purpose of paragraph (a) of this section, "designated high-altitude location" is any county which has substantially all of its area located above 1,219 meters (4,000 feet) and which is identified below:

Counties Located Substantially Above 1,219 Meters (4,000 Feet) in Elevation

State of Arizona

Apache	Navajo
Cochise	Yavapai
Coconino	

State of Colorado

Adams	Kit Carson
Alamosa	Lake
Arapahoe	La Plata
Archuleta	Larimer
Boulder	Las Animas
Chaffee	Lincoln
Cheyenne	Mesa
Clear Creek	Mineral
Conejos	Moffat
Costilla	Montezuma
Crowley	Montrose
Custer	Morgan
Delta	Otero
Denver	Ouray
Dolores	Park
Douglas	Pitkin
Eagle	Pueblo
Elbert	Rio Blanco
El Paso	Rio Grande
Fremont	Routt
Garfield	Saquache
Gilpin	San Juan
Grand	San Miguel
Gunnison	Summit
Hinsdale	Teller
Huerfano	Washington
Jackson	Weld
Jefferson	

State of Idaho

Bannock	Franklin
Bear Lake	Fremont
Bingham	Jefferson
Blaine	Lemhi
Bonneville	Madison
Butte	Minidoka
Camas	Oneida
Carribou	Power
Cassia	Teton
Clark	Valley
Custer	

State of Montana

Beaverhead	Madison
Deer Lodge	Meagher
Gallatin	Park
Jefferson	Silver Bow
Judith Basin	Wheatland
Powell	

State of Nebraska

Banner	Kimball
Cheyenne	Sioux

State of Nevada

Carson City	Lyon
Douglas	Mineral
Elko	Nye
Esmeralda	Pershing
Eureka	Storey
Humboldt	Washoe
Lander	White Pine
Lincoln	

State of New Mexico

Bernalillo	Mora
Catron	Rio Arriba
Colfax	Roosevelt
Curry	Sandoval
De Baca	San Juan
Grant	San Miguel
Guadalupe	Santa Fe
Harding	Sierra
Hidalgo	Socorro
Lincoln	Taos
Los Alamos	Torrance
Luna	Union
McKinley	Valencia
Otero	

State of Oregon

Harney	Klamath
Lake	

State of Texas

Jeff Davis	Parmer
Hudspeth	

State of Utah

Beaver	Piute
Box Elder	Rich
Cache	Salt Lake
Carbon	San Juan
Daggett	Sanpete
Davis	Sevier
Duchesne	Summit
Emery Garfield	Tooele
Grand	Uintah
Iron	Utah
Juab	Wasatch
Kane	Wayne
Millard	Weber
Morgan	

State of Wyoming

Albany	Natrona
Campbell	Niobrara
Carbon	Park
Converse	Platte
Fremont	Sublette
Goshen	Sweetwater
Hot Springs	Teton
Johnson	Uinta
Laramie	Washakie
Lincoln	Weston

* * * * *

(b)(1) * * *

(ii) * * *

(D) The emission-data vehicle(s) selected under § 86.084–24(b)(1)(v) shall represent all vehicles of the same engine-system combination as applicable.

(E) The emission-data vehicle(s) selected under § 86.084–24(b)(1)(viii) shall represent all vehicles of the same evaporative control system within the evaporative emission family, as applicable.

* * * * *

7. Section 86.084–35 is amended by revising paragraphs (a)(2)(iii)(D), and (a)(2)(iii)(G), removing and reserving paragraph (a)(1)(iii)(F), and adding paragraphs (a)(2)(iii)(H), (a)(2)(iii)(I), and (a)(2)(iii)(J) as follows:

§ 86.084–35 Labeling.

(a) * * *

(1) * * *

(iii) * * *

(F) [Reserved]

* * * * *

(2) * * *

(iii) * * *

(D) Engine tune-up specifications and adjustment, as recommended by the manufacturer in accordance with the altitude at which the vehicle is to be sold for principal use to the ultimate purchaser, including but not limited to idle speed(s), ignition timing, the idle

air/fuel mixture setting procedure and value (e.g., idle CO, idle air/fuel ratio, idle speed drop), high idle speed, initial injection timing, and valve lash (as applicable), as well as other parameters deemed necessary by the manufacturer. These specifications should indicate the proper transmission position during tune-up and what accessories (e.g., air conditioner), if any should be in operation. If adjustments or modifications are necessary to ensure compliance with emission standards at either high or low altitude, the manufacturer shall either include the instructions for such adjustments on the label, or indicate on the label where instructions for such adjustments may be found. The label shall indicate whether the engine tune-up or adjustment specifications are applicable to high altitude, low altitude or both.

* * * * *

(G) A statement, if applicable, that the adjustments or modifications indicated on the label are necessary to ensure emission control compliance at the altitude specified.

(H) A statement, if applicable, that the high-altitude vehicle was designed or modified for principal use at high altitude. This statement must be affixed by the manufacturer at the time of assembly or by any dealer who performs the high-altitude modification or adjustment prior to sale to an ultimate purchaser.

(I) A statement, if applicable, that the vehicle has been exempted from meeting the high-altitude gaseous emission standards as specified in § 86.084–9(g)(4) or § 86.085–9(g)(2), as applicable, and that its unsatisfactory performance under high-altitude conditions makes it unsuitable for principal use at high altitude.

(J) A statement, if applicable, that the vehicle has been exempted from meeting the high-altitude gaseous emissions standards as specified in § 86.084–9(g)(2) and, as a consequence, the emission performance warranty provisions of 40 CFR Part 85, Subpart V do not apply when the vehicle is tested at high altitude.

* * * * *

8. Section 86.084–38 is amended by adding paragraph (e)(3) as follows:

§ 86.084–38 Maintenance instructions.

* * * * *

(e) * * *

(3) Such instructions shall indicate what adjustments or modifications, if any, are necessary to allow the vehicle to meet applicable emission standards at elevations above 4,000 feet, or at elevations of 4,000 feet or less.

* * * * *

9. Section 86.085–9 is amended by revising the heading and by revising paragraph (a)(1) introductory text, (d) and (e), and adding paragraphs (f) and (g) as follows:

§ 86.085–9 Emission standards for 1985 and later model year light-duty trucks.

(a)(1) The standards set forth in paragraphs (a) through (c) of this section shall apply for trucks sold for principle use at other than a designated high-altitude location. Exhaust emissions from 1985 and later model year light-duty trucks shall not exceed:

* * * * *

(d)(1) Model year 1985 and later light-duty trucks sold for principal use at a designated high-altitude location shall be capable of meeting the following exhaust emission standards when tested under high-altitude conditions.

(i) *Hydrocarbons.* 1.0 grams per vehicle mile (0.62 grams per vehicle kilometer);

(ii) *Carbon Monoxide.* 14 grams per vehicle mile (8.7 grams per vehicle kilometer);

(iii) *Oxides of Nitrogen.* 2.3 grams per vehicle mile (1.43 grams per vehicle kilometer).

(2) The standards set forth in paragraph (d)(1) of this section refer to the exhaust emitted over a driving schedule and to idle emissions collected under the conditions as set forth in Subpart B of this part and measured and calculated in accordance with those procedures.

(e)(1) Fuel evaporative emissions from 1985 and later model year gasoline-fueled light-duty trucks sold for principal use at a designated high-altitude location shall not exceed 2.6 grams per test when tested under high-altitude conditions.

(2) The standard set forth in paragraph (e)(1) of this section refers to a composite sample of the fuel evaporative emissions collected under the conditions set forth in Subpart B of this part and measured in accordance with those procedures.

(f) No crankcase emissions shall be discharged into the ambient atmosphere from any 1985 and later model year gasoline-fueled light-duty trucks sold for principal use at a designated high-altitude location.

(g)(1) All light-duty trucks shall be capable (by initial design, adjustment, or modification) of meeting the applicable emission standards set forth in this section for any altitude of operation. Such adjustments and modifications shall:

(i) Be capable of being effectively performed by commercial repair facilities.

(ii) All adjustment and modifications recommended by the manufacturer to be performed on vehicles to satisfy this requirement must be approved in advance by EPA in accordance with § 86.079–22.

(2) Exemption for vehicles from the high-altitude emission standards as set forth in paragraph (d) of this section may be granted by the Administrator for vehicles that are expected to have unsatisfactofy performance under high-altitude conditions. Such exemptions will be granted upon petition by the manufacturer that the vehicle falls within the definition of vehicles eligible for exemption. A vehicle shall be considered eligible for exemption if its design parameters (displacement-to-weight ratio (D/W) and engine speed-to-vehicle speed (N/V)) simultaneously fall within the exempted range for that manufacturer for that year. The exempted range is determined according to the following procedure:

(i) The manufacturer shall graphically display the D/W and N/V data of all vehicle configurations it will offer for the model year in question. The axis of the abscissa shall be D/W (where (D) is the engine displacement expressed in cubic centimeters and (W) is the equivalent vehicle test weight expressed in pounds), and the axis of the ordinate shall be N/V (where (N) is the crank shaft speed expressed in revolutions per minute and (V) is the vehicle speed expressed in miles per hour). At the manufacturer's option, either the 1:1 transmission gear ratio or the lowest numerical gear ratio available in the transmission will be used to determine N/V. The gear selection must be the same for all N/V data points on the manufacturer's graph. For each transmission/axle ratio combination, only the lowest N/V value shall be used in the graphical display.

(ii) The product line is then defined by the equation, $N/V = C(D/W)^{-0.9}$, where the constant, (C) is determined by the requirement that all the vehicle data points either fall on the line or lie to the upper right of the line as displayed on the graph.

(iii) The exemption line is then defined by the equation, $N/V = C(0.84\ D/W)^{-0.9}$, where the constant, (C), is the same as that found in paragraph (g)(2)(ii) of this section.

(iv) The exempted range includes all values of N/V and D/W which simultaneously fall to the lower left of

the exemption line as drawn on the graph.

(3) The sale of a vehicle for principal use at a designated high-altitude location that has been exempted as set forth in paragraph (g)(2) of this section will be considered a violation of section 203(a)(1) of the Clean Air Act.

[FR Doc. 83-196 Filed 1-11-83; 8:45 am]
BILLING CODE 6560-50-M

federal register

Wednesday
January 12, 1983

Part IV

Environmental Protection Agency

Evaporative Emission Regulation and Test Procedure for 1985 and Later Model Year Gasoline-Fueled Heavy-Duty Vehicles; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 86

[AMS-FRL 2241-7]

Control of Air Pollution From New Motor Vehicles and New Motor Vehicle Engines; Evaporative Emission Regulation and Test Procedure for 1985 and Later Model Year Gasoline-Fueled Heavy-Duty Vehicles

AGENCY: Environmental Protection Agency.

ACTION: Final rule.

SUMMARY: This rule sets forth regulations for the control of evaporative emissions from gasoline-fueled heavy-duty vehicles (HDGs) for the 1985 model year. HDGs with a Gross Vehicle Weight Rating (GVWR) between 8500 and 14,000 lbs. must meet a 3.0 grams HC per test (gpt) standard while HDGs with a GVWR greater than 14,000 lbs. must meet a standard of 4.0 gpt. The test procedure being promulgated today as Subpart M is a full-SHED (Sealed Housing for Evaporative Determination) procedure similar to the light-duty vehicle evaporative emission test procedure. This regulation has a very favorable cost effectiveness and will bring two additional urban areas into compliance with the ozone standard if Inspection and Maintenance does not occur.

DATES: This regulation takes effect March 14, 1983 and its implementation date is the start of the 1985 model year.

Note.—Under Section 307(b)(1) of the Clean Air Act, EPA has determined that this action is nationally applicable. Accordingly, judicial review of this action is available only by the filing of a petition for review in the United States Court of Appeals for the District of Columbia Circuit within 60 days of publication. Under section 307(b)(2) of the Clean Air Act, the requirements which are the subject of today's notice may not be challenged later in judicial proceedings brought by EPA to enforce these requirements.

ADDRESSES: The information base on which this rulemaking is established is collected in Public Docket No. OMSAPC-79-1 at the Environmental Protection Agency, Central Docket Section, West Tower Lobby, Gallery I, 401 M Street, SW., Washington, D.C. 20460. The docket includes background materials, hearing transcripts, written comments, a Regulatory Support Document containing environmental, economic, and technical analyses performed during the rulemaking, the Summary and Analysis of Comments to the Notice of Proposed Rulemaking (April 30, 1980), and all other documents on which EPA has relied. The docket is open to the public and may be inspected between 8 a.m. and 4 p.m. on weekdays. A reasonable fee may be charged for copying services.

FOR FURTHER INFORMATION CONTACT: Mr. Timothy D. Mott, U.S. Environmental Protection Agency, Emission Control Technology Division, 2565 Plymouth Road, Ann Arbor, MI 48105, Telephone (313) 668-4387.

SUPPLEMENTARY INFORMATION: OMB Control Number: 2000-0390.

I. Description of Action

The following paragraphs describe the components of the rulemaking being promulgated today. Some of these components have been modified from those in the NPRM (45 FR 28922). Where changes from the NPRM have occurred this section briefly discusses the comments that EPA received which led to the changes. A more detailed presentation of the comments and how they relate to the requirements of this Final Rule can be found in the section titled "Public Participation".

A. Standards

EPA is adopting the proposed standard of 3.0 grams HC per test (gpt) for those HDGs with GVWRs between 8500 and 14,000 lbs (Classes IIB and III). For HDGs with GVWRs greater than 14,000 lbs (Classes IV and above), EPA is adopting a standard of 4.0 gpt. The majority of comments to the NPRM and EPA's analysis indicated that the 3.0 gpt level of control for these heavier HDGs would require a significant research and development (R&D) effort by the industry. By adopting the commenters' suggested emission standard, the expense of necessary R&D is greatly reduced. The 4.0 gpt standard represents approximately the same percentage reduction (92%) from uncontrolled levels of these "heavier" HDGs as the 3.0 gpt standard does from uncontrolled levels of the "lighter" HDGs because the uncontrolled "heavier" HDGs emit more evaporative hydrocarbons than do the "lighter" HDGs on average. In addition, since the number of these heavier HDGs is relatively small, this less stringent standard does not change the air quality impact of this regulation significantly.

B. Test Procedure

The test procedure for determining compliance with the standards (Subpart M) remains basically as proposed. It is a full-SHED procedure similar to the light-duty vehicle evaporative emission test procedure. Two changes were made in response to comments on the NPRM. First, the test weight was changed to 50 percent of GVWR instead of the proposed 70 percent because the additional data submitted by commenters showed it to be more representative of real world conditions. Second, data submitted indicated that 20 bench-type load-purge cycles were enough to stabilize new carbon canisters and thus this Final Rule has reduced from 90 to 20 the number of cycles required. Several minor amendments which correct omissions and typographical errors have also been included in the Final Rule.

C. Leadtime

The implementation date of this Final Rule is the start of the 1985 model year. The NPRM called for implementation with the 1983 model year, which was subsequently recognized to be infeasible. The final air quality analysis assumes implementation with the 1984 model year, but promulgation has taken considerably longer than was initially projected and 1985 is now the earliest feasible model year. The effect of the one-year delay (from 1984 to 1985) on the air quality analysis is small and probably would not be discernible. The Agency's analysis (see the "Summary and Analysis of Comments") concludes that implementation with the start of the 1985 model year (i.e., September 1984) will allow adequate leadtime for all manufacturers.

D. Certification Procedure

Another area which is somewhat different from the NPRM is the certification procedure. The Agency received a substantial amount of comment concerning this issue. The procedure described here was developed from the suggestions and data given to EPA and EPA's analyses of those materials. First, the definition of evaporative emission family has been changed by deleting fuel tank volume as a determinant. This will, as one commenter pointed out, significantly reduce the number of families (by 50 to 75 percent) which need to be developed and certified. At the same time it will not adversely affect the level of control because control systems may be overdesigned but not underdesigned. This is discussed in more detail below under this section "Public Participation."

Also, the definition of evaporative emission control system has been changed. This Final Rule adds four determinants (method of carburetor sealing, method of air cleaner sealing, number of storage devices and liquid fuel hose material) while it deletes one (vapor storage material). This new

definition of control system will more clearly differentiate control systems.

Another modification in response to comments allows each manufacturer to determine the amount and kind of testing, if any, it deems necessary to assure compliance with the full-SHED standards. In their comments, several manufacturers claimed that alternatives to the full-SHED test procedure can give results which predict full-SHED test results. These alternatives include bench testing, engineering evaluation, min/SHED testing and component testing. The Agency agrees in part with these comments. In addition, the Agency is not requiring that the manufacturers actually do full-SHED testing because: (1) the standards can be easily met, (2) the technology is proven, and (3) there is considerable light-duty truck (LDT) evaporative emission control experience which is directly applicable to HDGs. For example, EPA expects that for many HDGs which are virtually identical to LDTs (LDTs must meet a 2.0 gpt standard), manufacturers can simply install the LDT control system on the HDGs and be confident of meeting the 3.0 gpt standard without having to do any full-SHED testing.

EPA's analysis (see the "Summary and Analysis of Comments" which can be found in Public Docket No. OMSAPC-79-1) shows that allowing the manufacturers to determine their own testing requirements is the most cost-effective means of certification. Therefore, this Final Rule allows each manufacturer to use whatever test methods, evaluations, etc., it deems necessary to assure itself that its vehicles actually meet the full-SHED standards. The manufacturer is required to certify to EPA by written statement that its HDGs meet the full-SHED standards. The Agency will not normally require the manufacturer to submit its test data or evaluations. Nor does the Agency expect to do any routine confirmatory testing. However, the manufacturer is required to retain such data, evaluations, etc., and must submit this information to the Administrator upon request. Upon receipt of the manufacturer's written statement (and, if requested by EPA, other submitted information), EPA will review the submittal to ensure that the requirements of the Act and Subpart A have been met and then issue a certificate. EPA retains the right to do conformity testing although it generally does not expect to do so.

Heavy-duty gasoline-fueled vehicles with GVWRs greater than 26,000 lbs (Classes VII & VIII) are a special case and the certification procedure being finalized today recognizes this. EPA's projection of future sales of HDGs (see the "Regulatory Support Document") indicates that gasoline-fueled engines are not expected to be sold in those weight classes beyond about 1988. In the first four years of implementation of this regulation (i.e., through 1988) new sales of these HDGs are expected to total only 10,800 vehicles compared to 1,652,000 HDGs in the lower weight categories. This is only 0.65 percent of all HDGs sold in this time period.

If certification procedures were the same for these HDGs as for Classes IIB–VI, manufacturers would need to purchase expensive heavy-duty dynamometers which would no longer be needed after 1988. Since so few of these Class VII and VIII HDGs will be produced, the Agency believes that this cost would be unreasonably high. EPA has determined that, in the alternative, an "engineering evaluation" certification procedure will provide good evaporative emission control without imposing unreasonably heavy cost burdens. Under this approach, manufacturers are required to evaluate their control systems for Class VII and VIII HDGs on the basis of their design features to determine that such vehicles would meet a 4.0 gram HC per SHED test standard. The specific evaluation procedure is left to the manufacturer's discretion. As an example, the manufacturer might determine what differences exist between its Class VI HDGs and its Class VII and VIII HDGs that might be expected to create additional evaporative emissions. The manufacturer might then upgrade its control system for the Class VII and VIII HDGs where those differences occur so as to handle the extra emissions. Each manufacturer must then certify to EPA by written statement that its control systems for these HDGs are *designed* to meet a 4.0 gram HC per SHED test standard. Although the Agency will not normally require the manufacturer to submit its design evaluations, such evaluations must be retained for submission upon request. Once EPA has decided to issue the certificate of compliance, its enforcement plan is to assure that the control systems are manufactured as approved and are properly installed.

E. Incomplete Vehicles

The last major issue on which the NPRM requested comments was the problem of incomplete vehicles. Many HDGs leave the factory in an incomplete configuration. For example, these vehicles may not have the primary cargo carrying device attached or they may not have an engine compartment. These vehicles are sold to companies or individuals ("secondary manufacturers") who complete them to the specifications of the final customer. A problem can arise because the primary manufacturers must certify the vehicles before they are sold but the secondary manufacturers could affect the evaporative emissions of the vehicle when they complete them. By far the most significant instance of this is when a secondary manufacturer wants to add fuel tank capacity beyond that supplied by the primary manufacturer. Increasing the fuel tank capacity will increase the amount of hydrocarbon vapors which must be controlled. If the primary manufacturer's control system is not adequate to handle the extra fuel tank vapors then some of those vapors will escape to the atmosphere unless the control system capacity is upgraded.

The comments EPA received on this issue were extensive and very helpful. They indicated that the number of incomplete HDGs leaving the factories was close to 50 percent of all HDGs, which is considerably more than EPA had projected. The comments also revealed that the secondary manufacturers are usually small companies. Thus, secondary manufacturers cannot be expected to do full-SHED testing since the equipment for such testing is too expensive for these small concerns. Also, primary manufacturers cannot realistically be expected to "seek and find" the worst case completed configuration for each of the incomplete vehicles it sells. Such a search would need to include all of the hundreds of secondary manufacturers and would, therefore, be costly and very time consuming.

This Final Rule addresses the problem of incomplete vehicles. The primary manufacturer will place each of its incomplete vehicles in an evaporative emission family-control system. Each vehicle will be certified for sale with the issuance of the certificate of conformity for that family-system. Each incomplete vehicle will include a label stating the maximum fuel tank capacity for which the control system is valid. If a secondary manufacturer wishes to exceed this maximum fuel tank capacity, it must then increase the working capacity of the evaporative hydrocarbon storage device and notify EPA in writing of the change. The increased evaporative emissions due to the larger fuel tank must be adequately absorbed and not released to the atmosphere as a result of overloading the storage device. The regulations being adopted today include a ratio technique that secondary manufacturers

will use to determine the amount of extra storage capacity needed. A secondary manufacturer that increases fuel tank capacity beyond certified limits without complying with these conditions (or that changes other parameters so as to remove the vehicle from the family-system combination in which the vehicle was originally certified) will be potentially liable for "tampering" under section 203(a)(3)(A) of the Act.

II. Legal Authority

Section 202(a)(1) of the Act, as amended, 42 U.S.C. 7521(a)(1), provides that the Administrator shall prescribe standards for motor vehicle emissions if such emissions cause or contribute to air pollution which endangers the public health or welfare. The Administrator can require testing of new motor vehicles to determine compliance with applicable standards under section 206, 42 U.S.C. 7525. Section 202(b)(1)(C), 42 U.S.C. 7521(b)(1)(C), requires the Administrator to promulgate a test procedure for measuring "evaporative emissions of hydrocarbons" from heavy-duty vehicles. The general power to promulgate regulations is granted in section 301(a), 42 U.S.C. 7601(a).

III. Air Quality Impact

In spite of significant gains made in the control of non-methane hydrocarbon (NMHC) emissions, there are many air Quality Control Regions (AQCRs) which currently do not meet the National Ambient Air Quality Standards (NAAQS) for ozone. (Ozone is created during photo-chemical reactions involving NMHCs and is, therefore, controlled in large part by controlling NMHCs.) Air quality analyses show that attainment of the NAAQS for ozone will be difficult in many of these AQCRs, even if current and planned regulations for NMHC control are implemented. For this reason, EPA believes that all reasonable and cost-effective NMHC emission control strategies should be implemented.

EPA's analysis (see the chapter "Environmental Impact" in the "Regulatory Support Document" for this rulemaking) estimates that a typical low-altitude HDG will emit 341 less kilograms of NMHC over its life than will an uncontrolled HDG. This represents a 92 percent reduction from the uncontrolled levels. [For high-altitude HDGs the differential is 445 kilograms, which is also a 92 percent reduction from uncontrolled levels.) The analysis also shows that in 1988, assuming that Inspection and Maintenance (I/M) is not implemented, this regulation will result in four less exceedances of the ozone standards and two additional AQCRs attaining compliance.

IV. Economic Impact

The primary manufacturers each submitted cost estimates of the proposed rule which are summarized in the "Summary and Analysis of Comments" These estimates, however, were of limited usefulness in the analysis of the economic impact of this regulation, since they were very general in nature and, in some cases, consisted of a single, large number with little or no explanation as to its components or origin. Because the manufacturers' comments did not contain much detail and because this Final Rule incorporates changes from the proposal that significantly decrease the cost, EPA has estimated the costs of compliance with this Final Rule independently.

EPA's economic impact analysis (see Chapter V of the "Regulatory Suppport Document") shows that primary manufacturers will incur costs in the areas of testing equipment, research and development (R&D), facility space and control system hardware. Testing equipment needed includes such items as light-duty chassis dynamometer retrofit kits, HD SHEDs, flame ionization detectors (FIDs), chart recorders, heating blankets, and temperature achievers. EPA estimates the total industry investment in testing equipment will be $1.81 M (1981 dollars discounted at 10 percent to 1984). Also, the analysis allows a fair rate of return for the facility space needed for the test equipment and housing of test vehicles. The industry total for this facility space usage is $1.32M. Another cost will be incurred for R&D. EPA has estimated R&D costs to be $2.66M for the industry. These three costs (i.e., testing equipment, facility space and R&D) represent the fixed costs for the manufacturers. When this total cost of $5.79M (1981 dollars discounted at 10 percent to 1984) is amortized over five production years (1985 MY–1989 MY), the per vehicle cost increase due to fixed costs is $3.38.

Other costs that the manufacturers will incur are termed variable costs because they vary with the number of HDGs actually produced. In this case, the variable costs are the control system hardware costs. The hardware needed to control evaporative emissions from HDGs is well known. The evaporative emission control technology developed from many years of experience in the light-duty segment of the industry is directly applicable to heavy-duty vehicles. Furthermore, California has required control of evaporative emissions from HDGs since 1978 and thus each manufacturer already has produced HDGs with control hardware. The main components of a control system include charcoal canisters, tubing to route the vapors, roll-over valves, upgraded tubing for liquid fuel (less permeable), and charcoal in the air cleaner. EPA estimates the cost of the necessary control hardware will be $38.25 per HDG. This figure includes a substantial profit margin for both the manufacturer and the dealer.

The summation of the fixed costs and the variable costs gives a total of about $42 per vehicle. This is the expected "sticker price" increase that the consumer will see as a result of this regulation. Other possible areas of consumer cost increase (or decrease) could be changes in maintenance costs and/or changes in fuel economy resulting from this regulation. Based on light-duty evaporative emission experience EPA does not expect any change in the cost of maintaining a HDG. In the proposal EPA predicted that a substantial fuel savings would occur due to this regulation for vehicles with closed-loop fuel induction systems. However, since publication of the proposal, the possibility of closed loop fuel induction for HDGs has become much less likely so these fuel savings are unlikely. Neither does EPA expect that there will be any increase in fuel cost as a result of this regulation. Therefore, the $42 "sticker price" increase in EPA's estimate of the total cost to the consumer. this is a small amount to pay for the NMHC control achieved by this rule, as is discussed under the section "Cost Effectiveness."

For the large majority of consumer items, as price increases the number of items sold decreases. The amount of decrease in the number of items demanded given a unit increase in price is termed the elasticity of demand for that item. Studies have shown that the elasticity of demand for heavy-duty trucks is between −0.5 and −0.9. EPA has assumed an elasticity of −0.7 and a price range of $11,000 to $54,000 for HDGs. With a retail price increase of $42, EPA estimates that this regulation may cause a decrease in the number of HDGs sold of between 0.08 percent and 0.27 percent. Thus, the impact of this regulation on sales of new HDGs will be extremely slight.

Another view of the cost of this regulation is from the national or aggregate perspective. This view would include any costs incurred by the industry that it could not recoup from the consumer, plus the total consumer cost. Since the manufacturers will

recoup all costs, the aggregate cost is simply the consumer cost on a per vehicle basis times the number of vehicles sold over some time period. As is customary, EPA has calculated the aggregate cost for this regulation on a five year basis. The Agency estimates that from 1985 MY to 1989 MY, 2,060,000 new HDGs will be sold. Multiplying annual production by $42 per vehicle and discounting to 1984 at 10 percent yields a five-year aggregate cost of $71.7M.

V. Cost-Effectiveness

While the air quality impact of this regulation, as measured by decreases in exceedances and in the number of AQCRs not in compliance, is relatively small, it must be remembered that the cost of this regulation is also relatively small. As discussed above, EPA expects that all reasonable and cost-effective NMHC control strategies will be implemented to bring the urban AQCRs into compliance with the NAAQS for ozone. The prospect that an AQCR may not be in compliance even after all reasonable control strategies are exhausted does not mean that such strategies should be abandoned, since they would result in progress towards cleaner, healthier air.

The cost effectiveness of a regulation is expressed in terms of the number of dollars it takes to control one ton of pollutant. By expressing all regulations in this manner they can be compared. From an economic efficiency viewpoint, those strategies which are the cheapest per ton of pollutant controlled should be successively implemented until the NAAQS is attained. Generally, this has been the approach with NMHC control strategies. However, the NAAQSs for ozone have not yet been attained in all regions of the country.

EPA has calculated the cost effectiveness of this regulation to be $112/ton of NMHC controlled. This is much cheaper than many other NMHC control strategies that have already been implemented. For example, the regulation lowering the LDV exhaust emission standard from 1.5 to .41 grams HC per mile was estimated to have a cost-effectiveness of $470/ton. Also, the cost-effectiveness of lowering the light-duty truck (LDT) exhaust emission standard from 2.0 to 1.7 grams HC per mile was calculated to be $200/ton. Controlling motorcycles from uncontrolled levels to 8 grams HC per mile was estimated to cost $365/ton. Other examples can be found in the chapter entitled "Cost-Effectiveness" in the "Regulatory Support Document." Clearly the control of evaporative emissions from HDGs is more cost-effective than any of these other regulations which have already been promulgated. This superior cost effectiveness in concert with the fact that many AQCRs are not meeting the NAAQS for ozone leads EPA to conclude that this regulation is a necessary and worthwhile NMHC control strategy.

VI. Public Participation

After the public hearing of June 25, 1980, manufacturers, trade associations and individuals submitted their final, written comments on the proposed regulation. These comments were grouped into major issues and this section will review these major issues and summarize EPA's response to each. A more detailed presentation of each issue, EPA's analysis and its recommendations can be found in the document entitled "Summary and Analysis of Comments to the Gasoline-Fueled Heavy-Duty Vehicle Evaporative Emission Proposal." This document is available in the public docket for this rulemaking.

A. Level of the Standard

The NPRM included a standard of 3.0 grams HC per test (gpt) that all HDGs would have to meet in order to be certified under § 203 of the Act. EPA arrived at this level by examining the differences between LDTs and HDGs that would affect evaporative emissions. (The current LDT evaporative emission standard is 2.0 gpt.) The main differences are: (1) HDGs tend to have larger fuel tank capacities, (2) HDGs tend to be physically bigger leading to increased background emissions, and (3) some HDGs have larger carburetor fuel bowl volumes. By analyzing all available data on these three sources of evaporative emissions, ERA estimated the increases in controlled emissions that might occur as one moved from LDTs to HDGs. This analysis showed that HDGs could reasonably be expected to meet a 3.0 gpt standard.

The comments received on this issue tended to split HDGs into the two general classes of "lighter" HDGs and "heavier" HDGs. The two largest manufacturers agreed that a 3.0 gpt standard is technically feasible for the "lighter" HDGs although they disagreed slightly as to where the split between "light" and "heavy" should occur. One wanted the split at 12,000 lbs. GVWR while the other suggested 14,000 lbs. GVWR. Since there is little difference between vehicles with GVWRs of 12,000 or 14,000 lbs. and since 14,000 lbs. GVWR is the traditional breakpoint between heavy-duty vehicle Classes III and IV, EPA has chosen to split HDGs at 14,000 lbs. GVWR. Thus, this Final Rule requires all HDGs less than or equal to 14,000 lbs. GVWR to meet a standard of 3.0 gpt.

The manufacturers felt that while a 3.0 gpt standard is appropriate for the "lighter" HDGs, such a standard would be difficult for the "heavier" HDGs. They claimed that the increased fuel tank volumes, the large carburetor fuel bowls and the increased amount of background emissions would not allow them to attain a 3.0 gpt level without considerable R&D. In fact, one manufacturer's extensive HDG test program on current California evaporative control systems showed a "light" HDG meeting 3 gpt while a "heavy" HDG tested between 3 and 4 gpt. Again, only the two largest manufacturers suggested a feasible level of control for these "heavier" HDGs. They both agreed that 4.0 gpt would be feasible.

Although it may be technologically feasible for these "heavier" HDGs to meet a 3.0 gpt standard, EPA concludes that a 4.0 gpt standard is more appropriate for the "heavy" HDGs (GVWs of 14,001 to 26,000 lbs.) because it improves the cost-effectiveness of the regulation and allows manufacturers to avoid the additional R&D that would be necessary to meet a 3.0 gpt standard. A 4.0 gpt standard can be met by the "heavier" HDGs with the same evaporative control technology as that used by the "lighter" HDGs to meet the 3.0 gpt standard. This less stringent standard will result in no significant loss of air quality benefits because of the small number of HDGs involved. (The difference in HC control is less than 0.1 percent of the mobile source fleet emissions in 1995.) Furthermore, it equalizes the percentage reduction from uncontrolled levels for these two groups of HDGs at 92 percent.

To further reduce the burden on the manufacturers, this Final Rule requires that all HDGs greater than 26,000 lbs. GVWR need only be certified to a 4.0 gpt level by engineering evaluation. These very heavy HDGs are currently a very small percentage of the total number of HDGs sold each year and EPA expects sales of these vehicles to approach zero by the end of 1988.

To summarize, this Final Rule requires that all HDGs less than or equal to 14,000 lbs. GVWR (Classes IIB and III) meet a standard of 3.0 gpt. Also, all HDGs with GVWRs greater than 14,000 but less than 26,001 lbs. (Classes IV through VI) must meet a standard of 4.0 gpt. Finally, all HDGs with GVWRs greater than 26,000 lbs. (Classes VII and above) will be certified by submitting a

written statement that the control systems are *designed* to meet a standard of 4.0 gpt.

B. Certification Procedure

The Agency received a substantial amount of comment on the proposed regulation. The comments included new data, suggestions and analyses which clarified and broadened EPA's understanding of the issues involved in controlling evaporative emissions from HDGs. The certification procedure being finalized today is less burdensome to manufacturers of HDGs than the proposed procedure. However, no significant loss of air quality benefits should result from these changes as discussed below. Rather, the changes stem from the comments to the NPRM and represent a more efficient method of implementing this Final Rule. The Agency's detailed analysis of the comments and their implications on this issue can be found in the "Summary and Analysis of Comments" for this rulemaking.

Under the certification procedure being finalized today, manufacturers will place each HDG they wish to sell in an evaporative emission family-control system combination. The determinants of the family and the control system have been changed from the NPRM. The evaporative emission family was defined in the NPRM by parameters which contribute to evaporative emissions from the vehicle. These parameters included the nominal fuel tank capacity (within 20 gallons, or within 25 percent, whichever is greater), the method of fuel/air metering (i.e., carburetor vs. fuel injection), and the carburetor fuel bowl volume (within a 10cc range). This Final Rule deletes the nominal fuel tank capacity as a family determinant. Thus, vehicles need only be the same with respect to the method of fuel/air metering and carburetor fuel bowl volume (within a 10cc range) to be placed in the same family.

The deletion of nominal fuel tank capacity as a family determinant (which was strongly endorsed by the comments) should result in a 50–75 percent reduction in the number of family-systems that must be developed and certified which, in turn, will save the manufacturers substantial amounts of time and money. Under the originally proposed vehicle classification system if two vehicles were identical except that one had a 30 gallon fuel tank and the other had a 60 gallon fuel tank they would be placed in different family-systems and a development and certification program would have had to be undertaken for both. This Final Rule allows the manufacturer to place both vehicles in the same family-systems and then develop for certification only the worst case vehicle (i.e., the vehicle with the 60 gallon fuel tank). This change from the NPRM is expected to reduce the number of evaporative family-systems which must be developed for certification from 25–30 to 6 or 8 for each of the two larger manufacturers. For the two smaller manufacturers, reductions should be on the order of 50 percent.

This reduction in the number of family-systems will not increase evaporative emissions. In fact, fewer family-systems may actually result in a decrease in evaporative emissions because the evaporative emission control system that is designed to control the worst case vehicle will be slightly over-designed for the less-than-worst case vehicles in that same family. Thus, the control of these less-than-worst case vehicles may be a little better, due to the extra "safety margin" of the control system. This extra safety margin will probably consist of somewhat more activated charcoal in the cannisters than might have been the case under the NPRM family-system scenario and, therefore, the extra cost associated with this extra safety margin should be negligible.

The definition of an evaporative emission control system has also been changed from the NPRM definition. The NPRM control system determinants were method of vapor storage, vapor storage material, vapor storage working capacity (within 20 grams), method of purging stored vapors, and method of carburetor fuel bowl venting during both engine operation and engine off. The control system determinants as contained in this Final Rule are method of vapor storage, method of carburetor sealing, method of air cleaner sealing, vapor storage working capacity (within 20 grams), number of storage devices, method of purging stored vapors, method of venting the carburetor during both engine off and engine operation, and liquid fuel hose material. These changes made to the NPRM represent an attempt to define more clearly a control system so that differences between control systems will be more easily recognized.

These provisions allow manufacturers to develop family-systems which are most cost effective for them. For example, one manufacturer may choose to include an extensive range of fuel tank volumes in the design of its control system. This will probably mean that the control system will be somewhat overdesigned for the smaller fuel tank volumes because the control system must be sufficient to handle emissions from the largest fuel tank volumes (worst-case). Thus, the air quality benefits have not been jeopardized and, in fact, have been enhanced by providing this flexibility.

Another change to the NPRM is the procedure for issuance of certificates of conformity. Under the NPRM each manufacturer would have had to test its family-systems and submit the test results to EPA. EPA would have reviewed the data and done confirmatory testing if the Agency deemed it necessary. With the change to the less stringent standard of 4.0 gpt for HDGs with GVWRs greater than 14,000 lbs, the Agency concludes that compliance will be relatively straightforward. EPA expects that in many cases the evaporative control systems used on LDTs can be directly applied to lighter HDGs. Since LDTs are currently meeting a 2.0 gpt standard, the Agency is confident that these lighter HDGs, which need only meet a 3.0 gpt standard, should easily meet the standard. Also, the comments indicated the manufacturers' belief that abbreviated testing procedures such as component testing in mini-SHEDs or bench-testing could provide sufficient data to allow manufacturers confidence in the actual full-SHED test control level without having to run the full-SHED test for all cases.

From the above, EPA concludes that in many cases actual full-SHED testing will not be necessary to establish that vehicles are meeting the appropriate standard. Therefore, this Final Rule allows manufacturers to use any testing or evaluation method they choose to establish that their vehicles actually meet the full-SHED standard. Once they establish compliance, they will submit a written statement to EPA indicating as much. After reviewing the statement (and, any other requested information), EPA will issue a certificate, if it concurs with the manufacturer's judgement. Thus, each manufacturer can be assured timely certification of its product line. As is currently the case in other mobile source emission control areas, complete records will be required of any testing and/or evaluation. Furthermore, these records will be available to the Administrator upon request.

Because EPA expects that the levels of control required by this regulation will be relatively easy to attain, it does not plan to do routine confirmatory testing. Neither does it plan, at this time, to do routine in-use testing. However, if in the future, the Agency has reason to suspect that HDGs are not meeting the appropriate standards then such testing

could be done and would utilize the full-SHED test procedure.

C. Selective Enforcement Auditing

EPA recognizes that newly assembled vehicles may have high background emissions unrepresentative of typical in-use background emissions. Specific examples of these non-fuel emissions are vehicle paint, sealers, and sound deadeners. These sources of HC emissions eventually become stabilized, but generally not for many weeks. Selective Enforcement Audits (SEAs), which are conducted on new vehicles, would be very cumbersome because of the difficulty associated with distinguishing fuel evaporative emission from emissions from non-fuel sources. Because of the required additional testing burden and associated costs, the difficulties associated with testing production HDGs, and because most evaporative control systems are generally reliable, these regulations do not, at this time, provide for SEAs of HDG evaporative emissions. The Agency does, however, reserve the right to establish a SEA program if future circumstances dictate.

D. Leadtime

In the NPRM, EPA stated that required leadtime for implementation of this regulation would be relatively short. The technology required to meet the proposed standard is simple and the manufacturers have had experience in its application on light-duty vehicles and light-duty trucks for many years. Furthermore, California has required the control of evaporative emissions from HDGs since 1978. Thus, for those HDG models which are sold in California, manufacturers have already designed, produced and installed control systems. Accordingly, the R&D required is expected to be quite limited. EPA originally proposed 6 months for R&D, 6 months to finalize production designs and produce the necessary drawings, and, finally, 10 months for tooling changes. Certification testing was expected to occur simultaneously with tooling changes as is common practice. The total leadtime was predicted to be 22 months. Since the Final Rule was projected to be published in December of 1980, implementation could have occurred by September of 1982. EPA assumed that the HDG model year began each September and, therefore, concluded that this regulation should become effective with the 1983 model year.

The four primary manufacturers were the only commenters addressing this issue. General Motors (GM) claimed that it would need 35 months after publication of the Final Rule to implement the regulation as proposed. Ford estimated it would need 34 months of leadtime while International Harvester (IH) stated it would need 32 months. Chrysler did not present a leadtime estimate. Instead, Chrysler stated that compliance by 1983 was not feasible because 12 months would be needed for test facility procurement before any R&D could begin and the remaining leadtime would be insufficient for the necessary R&D.

This Final Rule incorporates changes from the NPRM which will decrease the required leadtime. The manufacturers will not have to do any formal certification testing and EPA does not generally expect to do confirmatory testing. Thus, the turn-around time for EPA to issue certificates will be brief. According to comments from GM and Ford, certification testing and EPA turnaround was expected to take 5 to 6 months. This amount of time is no longer necessary.

Other changes from the NPRM influence the amount of R&D which, in turn, reduces leadtime. The new family-system determinants allow the manufacturers to develop control systems for the worst case vehicles and then cover the less than worst case vehicles with that control system if they wish. These new determinants will substantially reduce the number of evaporative emission family-control system combinations that will need to be developed and certified. For example, GM and Ford were predicted to have 25 to 30 family-systems each. The new classification system will reduce this to about 6 or 8. Substantial reductions for Chrysler and IH will also occur. These reductions mean that the time needed for R&D will be lessened.

Another change from the NPRM which reduces the time for required R&D is the split standard included in this Final Rule. The proposed 3.0 gpt standard is retained from HDGs with GVWs less than 14,001 lbs. The commenters agreed that this level of control could be accomplished with current LDT evaporative emission control technology. Therefore, little or no R&D should be needed. For HDGs with GVWs greater than 14,000 lbs but less than 26,001 lbs (Classes IV–VI), the standard has been increased to 4.0 gpt from the proposed 3.0 gpt. This will substantially reduce the R&D necessary for these vehicles. For certification of HDGs with GVWs greater than 26,000 lbs, manufacturers will only need to establish by engineering evaluation that their vehicles are designed to meet a 4.0 gpt standard and then submit to EPA the appropriate written statement. EPA expects that R&D for these vehicles will be nil.

The final modifications to the NPRM which will have an impact on leadtime are test facility requirements. The proposed test procedure would have required the purchase and installation of a heavy-duty dynamometer, which can take 12 months. This Final Rule has been structured to allow the use of light-duty dynamometers which have been upgraded to handle 13,500 lbs of inertia weight. This reduces the time required to establish a test cell from 12 months to only 6 months.

Nevertheless, because of delays in the final promulgation of this rulemaking, manufacturers clearly could not comply by the start of the 1983 MY. EPA's analysis (see the "Summary and Analysis of Comments") concludes that all manufacturers can comply with this Final Rule if given 19 months of leadtime. Therefore, this rule will be implemented beginning with the 1985 model year (i.e., September 1984). The extra available leadtime, beyond the required 19 months, will allow better planning for more efficient use of resources and will stretch out the financial commitment for a better cash flow.

On a related matter, since some manufacturers introduce their new heavy-duty *vehicles* 3 to 4 months before their new heavy-duty *engines* (January 1), the question arises as to what should be the start of the model year. This Final Rule requires each manufacturer to designate its heavy-duty *vehicle* introduction date as the beginning of its model year for the purposes of this regulation. Thus, the situation might arise where a manufacturer would have to certify its HDGs twice in one year.

Generally speaking, EPA expects that the family-system combinations certified will be used year after year and, thus, the manufacturers will be able to carry-over certification to avoid having to recertify their HDGs at the start of each new model year. However, a new certification might be required before the start of the new model year (i.e., about September 1) if a HDG model undergoes significant changes from one year to the next. An additional certification might be required if an engine for that HDG also undergoes significant changes which affect evaporative emissions to the point of requiring the creation of a new evaporative emission family-system for the HDG. If this new engine with its associated new family-system is to be introduced January 1, or 4 months after

the new vehicle introduction, the new family-system will have to be certified.

This "dual" certification might, at first glance, seem to be an excessive burden on the industry. However, when it is considered that: (1) Certification will usually consist of only a statement of compliance by the manufacturer, and (2) a manufacturer must always develop its evaporative and exhaust emission control systems simultaneously to ensure that both systems meet the appropriate standards, then it is clear that "dual" certification will generally be no more than the submittal of a second statement of compliance which is an inconsequential extra burden.

E. Incomplete Vehicles

Most LDVs and LDTs are sold by the primary manufacturer in a completed form. However, many HDGs are sold to secondary manufacturers in various stages of completeness. Some HDGs leave the factory with only the chassis and engine. Others include an engine compartment and/or an operator's enclosure. Still others include the above plus the cargo carrying device but no fuel tanks. These incomplete HDGs are completed by the secondary manufacturers to do a specific job.

These incomplete vehicles presented a problem in developing this HDG evaporative emission regulation because the additions and modifications made by the secondary manufacturers can affect evaporative emissions. For example, a cargo-carrying device can trap exhaust heat around fuel tanks and fuel lines which in turn can increase the evaporative emissions from these sources. Since the vehicles leave the primary manufacturer in incomplete and, therefore, untestable forms and since the secondary manufacturers are usually small to medium-sized companies that cannot easily afford to test the vehicles, the problem arises as to the best way to ensure that these incomplete vehicles meet the applicable evaporative emission standards when completed.

In the NPRM, EPA proposed that the primary manufacturer certify, in a completed configuration, all incomplete vehicles which it markets. The manufacturer would have determined the limits of a worst case completed vehicle by soliciting information from the secondary manufacturers. The parameters for which the primary manufacturer would have had to determine worst case limits included fuel tank volume, carburetor bowl fuel volume, method of vapor storage, vapor storage material, vapor storage working capacity, method of carburetor bowl venting, vapor purging technique, fuel system, maximum GVWR, maximum frontal area, body type and other features as specified by the Administrator. A secondary manufacturer who completed a vehicle for sale would have had to remain within the limits of the certified worst case configuration in order to be covered by the original certificate of conformity. If the secondary manufacturer exceeded the limits to which the vehicle had been certified, then, under the NPRM, the secondary manufacturer would have had to conduct its own certification program.

EPA received substantial comment on this issue both at the public hearings and in the final, written comments. The manufacturers claimed that the Agency had underestimated the burden which would result if the proposed solution were implemented. The comments from the primary manufacturers can be divided into three main subissues: (1) Vaguely defined parameters, (2) the search for worst case limits, and (3) vicarious liability.

The manufacturers stated that some of the evaporative emission parameters were vaguely defined and, therefore, the determination of what was worst case would be very difficult. For example, "body type" was a listed parameter but which body types might cause lesser or greater amounts of evaporative emissions were not defined. Body types come in many shapes and sizes and the general theory of how body types influence evaporative emissions is well known. However, the existing data base on how much influence particular body types have on evaporative emissions is very limited. The determination of a worst case body type could have required the manufacturers to undertake a substantial R&D program.

The commenters were also concerned that finding the worst case for each parameter would be very difficult. There are hundreds of secondary manufacturers who purchase incomplete vehicles and then complete those vehicles to their own or a third party's specifications. The primary manufacturers stated that the effort involved in contacting all of the secondary manufacturers and then determining the worst case for each parameter would be very burdensome. The primary manufacturers claimed they not only had no information as to how their incomplete vehicles were completed but that in some cases the final form of the completed vehicle might not be determined for months.

The third area of concern by the primary manufacturers was that of vicarious liability. They claimed that completed vehicles could be within the worst case limits and still fail to meet the standard because of other modifications made by the secondary manufacturers which affect evaporative emissions. They claimed that under the proposed rulemaking the primary manufacturer would be liable for such noncomplying vehicles even though such vehicles were certified when they left the factory.

The comments from the secondary manufacturers generally stated that they did not have the resources to do SHED testing and, therefore, the Final Rule should not require any testing on their part.

EPA found the comments very helpful in analyzing this complex issue. Although the problems associated with incomplete vehicles were recognized in the NPRM, the comments clarified the magnitude of the problems. For example, when the NPRM was published the Agency had estimated that incomplete HDGs were only about 10 percent of all HDGs. EPA has subsequently learned that the proportion is more likely 40–50 percent. This makes the proposed solution to the incomplete vehicle problem substantially more burdensome. As a result of the comments and in an effort to make this regulation less burdensome, EPA has eliminated all of the vaguely defined parameters and has removed the possibility that primary manufacturers will be held liable for the subsequent actions of others.

This Final Rule requires the primary manufacturers to place each of its incomplete vehicles in an evaporative emission family-control system grouping (see Certification Procedure). Each incomplete vehicle will have a label specifying the maximum fuel tank volume for which the control system is designed. Secondary manufacturers will be responsible for correct assembly of the evaporative emission control system (if applicable). If a secondary manufacturer modifies a control system or a vehicle so as to remove it from the evaporative emission family-control system in which it was originally certified (except as discussed below), then that secondary manufacturer is potentially liable for tampering under section 203(a)(3) of the Clean Air Act.

If a secondary manufacturer wishes to add fuel tank volume in excess of the maximum specified by the primary manufacturer, it must increase the adsorptive capacity of the evaporative hydrocarbon storage device(s) (e.g., charcoal canisters). The increased amount of evaporative hydrocarbons due to the larger fuel tanks must be trapped in the storage device and not

released to the atmosphere. This Final Rule provides a ratio technique for secondary manufacturers to use to determine the amount of extra adsorptive capacity they must provide given an increase in fuel tank capacity beyond the maximum specified by the primary manufacturer. This ratio technique can be found in § 86.085–35 of Subpart A of the regulations. The secondary manufacturer is required to submit a written statement to EPA that the evaporative hydrocarbon storage device(s) has been upgraded as required. The HDG will be considered in compliance when EPA is notified that the appropriate change in the storage device has been made.

The Agency does not expect the above situation to occur often because the storage devices used by the primary manufacturers usually have excess capacity. Also, secondary manufacturers who do anticipate adding fuel tanks to HDGs can notify the primary manufacturers as to how much extra fuel tank capacity they want to add. In turn, the primary manufacturers should have no problem providing the required adsorptive capacity with the evaporative emission control system that comes with the incomplete vehicle.

The above solution to the incomplete vehicle problem will substantially reduce the cost of compliance for the primary manufacturers as compared to the NPRM approach. EPA realizes that the potential still exists for incomplete vehicles to be completed in configurations where additional amounts of heat are trapped near fuel tanks or carburetors than expected by the primary manufacturer. This additional heat may cause the NMHC vapors from fuel tanks or carburetors to increase somewhat from levels that might otherwise be expected. This does not mean that such increased vapors will reach the atmosphere. EPA believes that sufficient excess capacity exists in the typical control system to adequately handle these extra vapors. Therefore, the Agency concludes that no significant loss of air quality benefits should result from this solution to the incomplete vehicle problem. This does not, however, mean that secondary manufacturers who alter certified vehicles in such a way as to cause actual emissions exceedances will be relieved of liability for "tampering."

F. Test Procedure

This Final Rule includes a test procedure which is similar to the light-duty vehicle evaporative emission test procedure. However, instead of requiring expensive mileage accumulation on the full vehicle, new carbon canisters are allowed to be stabilized by flowing HC vapors through them and then purging them with air. (The proposal called for this cycle to be repeated 90 times until equilibrium was obtained.) The vehicle is then placed in an airtight enclosure known as a Sealed Housing for Evaporative Determination (SHED) where heat blankets raise the temperature of the fuel from 60°F to 84°F over a one hour period. The total amount of HC (in grams) emitted during this hour is the "diurnal" result. Next the vehicle is placed on a chassis dynamometer where it is driven over the heavy-duty chassis cycle. This purges the canisters in a way that is representative of real world conditions and also heats up the engine compartment for the "hot-soak" phase of the test.

After the driving cycle, the vehicle is again placed in a SHED where the HC vapors emitted over one hour are measured. These vapors originate primarily from the carburetor fuel bowl which is heated by the hot engine compartment. The result of this 1-hour "hot-soak" is added to the 1-hour "diurnal" to give the total test result.

The manufacturer's comments on the proposed test procedure included a number of items dealing with clerical errors and obvious omissions. These comments will not be discussed here but are detailed in the "Summary and Analysis of Comments." Other, more important, comments fell into six main areas: (1) Test weight, (2) dynamometer load formula, (3) driving cycle, (4) fuel temperature rise, (5) canister preconditioning, and (6) hood open versus closed.

In the proposal the test weight was specified as 70 percent of GVWR. The manufacturers claimed that this was too high and that a typical HDG is probably loaded such that its actual weight is only 30–60 percent of GVWR. As test weight increases, the amount of canister purging decreases and the underhood temperature increases. Both of these factors tend to increase the amount of evaporative emissions. The original test weight factor of 70 percent GVW was based primarily on Federal Highway Administration data. The commenters correctly pointed out that such data is derived mainly from interstate traffic. The commenters also presented other data which accounted for local traffic and showed the factor to be about 50 percent. Therefore, EPA has changed the proposed 70 percent factor to 50 percent in this Final Rule.

The dynamometer load formula was criticized for producing a horsepower setting too high. The commenters stated that many HDGs had van or pickup body types. The aerodynamic drag coefficients for light-duty vans and pickups are .50 and .58 respectively. However, the NPRM proposed an aerodynamic drag coefficient for all HDGs of .67. This coefficient is too low for some large HDGs and it is too high for some small HDGs (such as vans and pickups). In general, EPA had concluded that .67 could adequately represent all HDGs. The lighter HDGs, which are the easiest to control to the 3.0 gpt level and have the greatest power reserves (i.e., effect of purging loss from increased horsepower settings will be minimal), will have horsepower settings somewhat higher than they would under real world conditions while the largest HDGs, which are more difficult to control, would tend to get a reduction in stringency because their horsepower settings will tend to be lower.

After analyzing the comments on this subissue, EPA has concluded that the .67 aerodynamic drag coefficient should be retained in this Final Rule. If the rule were to allow the use of .50 for vans and .58 for pickups, then EPA should also develop coefficients for other HDG body types. Since the number of different HDG body types is quite large, the effort to derive such coefficients would be substantial. Because: (1) The differences in horsepower setting with a .67 factor as compared to other factors will not be large, (2) those differences will affect evaporative emissions only in a minor way, and (3) the standard has been made more lenient, EPA believes that the cost of deriving aerodynamic drag coefficients for each HDG body type would far outweigh the small cost-savings that might be obtained.

One manufacturer questioned why EPA did not allow the optional use of "coastdowns" to establish dynamometer horsepower settings. The Agency had assumed that the manufacturers would prefer to use the simple and less costly dynamometer road load formula. However, this Final Rule includes a provision for the use of the "coastdown" procedure in setting the dynamometer horsepower. The "coastdown" procedure is well established and is used almost exclusively in light-duty vehicle certification. The manufacturer must retain its "coastdown" results for EPA review upon demand. Such records should exhibit good engineering practice.

The manufacturers claimed that the driving cycle proposed was not representative of real world trips by HDGs. They claimed that the amount of off-idle purge time was too little. These same manufacturers made the same

claim of unrepresentativeness during the heavy-duty engine exhaust emission rulemaking (45 FR 4136). That rulemaking included an engine dynamometer cycle which was generated from the same data base (i.e., CAPE–21) and used the same generation technique (i.e., Monte Carlo) as the chassis dynamometer cycle of this evaporative emission rulemaking. In the exhaust emission rulemaking EPA concluded that the data base and generation technique were valid and, therefore, the cycle was representative. The same arguments apply to this rulemaking and the reader is referred to that previous analysis (See the "Summary and Analysis of Comments" in Public Docket #OMSAPC–78–4) for additional discussion. Furthermore, the chassis cycle of this rulemaking only serves to condition the vehicle for the rest of the test, hence, precise characterization of in-use vehicle operation is substantially less critical than with the engine cycle where emissions are measured.

Another important area of comment on the proposed test procedure was the fuel temperature rise during the "diurnal" portion of the test. EPA proposed a 24°F temperature rise (60°F–84°F). The manufacturers claimed that this was too much and that a 15°F rise would be more appropriate. Their main contention was that since HDG fuel tanks are generally bigger than light-duty fuel tanks, the temperature rise would be less given that both fuel tanks receive the same amount of energy input, because the greater fuel volume would require more energy to reach the same final temperature.

EPA's analysis of this subissue indicates that the 24°F temperature increase is appropriate for HDGs. In many cases, HDG fuel tanks are exposed to more heat than are light-duty fuel tanks because the HDG fuel tanks are saddle-type tanks and are exposed to direct sunlight. Light-duty tanks, however, are usually located beneath the vehicle and, thus, are shaded. The comments also indicated that the fuel in a tank will rise about 75 percent of the ambient temperature rise. A 15°F fuel temperature rise would therefore, indicate a 20°F ambient temperature rise. While a 20°F ambient temperature may be more "average" than the 32°F ambient temperature rise that a 24°F fuel temperature rise simulates, the "average" is not the correct consideration in this case. "Worst-case" is more appropriate because if carbon canisters experience breakthrough, the amount of HC vapors entering the atmosphere will rise dramatically. The 32°F ambient temperature rise occurs rather frequently and, hence, EPA has retained the 24°F fuel temperature rise for this Final Rule.

EPA's analysis of the subissue concerning the number of canister load-purge cycles needed to stabilize the activated charcoal in new canisters concludes that the proposed 90 bench-type cycles for a new canister was excessive; therefore, this has been reduced to 20 in this Final Rule. After these 20 bench-type cycles, the vehicle must be driven over the chassis cycle and then soaked for a total of ten times, as in the proposal, to complete this virgin canister stabilization. EPA has concluded that this change will have no impact on the level of control.

Finally, EPA's analysis concludes that since the Final Rule provides for a doubling of the maximum cooling capacity of the fans (from 5,300 cfm to 10,600 cfm), the hoods of the HDGs should remain closed during operation over the driving cycle. If, however, the manufacturer can show that during field operation the vehicle receives additional cooling, and that such additional cooling is needed to provide a representative test, the fan capacity may be increased or additional fans used.

G. Durability and Deterioration

EPA received no comments on these issues so this Final Rule is essentially unchanged from the NPRM. EPA is unable to specify a single test procedure for the evaluation of vehicle evaporative emission control system deterioration during the useful life of the vehicle. EPA has, however, identified environmental and usage parameters which affect the durability of evaporative emission control systems during their useful lives. These parameters are: vibration, the vapor load-purge cycling of the vapor control system, and the aging effect of heat and ozone. Thus, for the purpose of satisfying the requirement of the Clean Air Act that EPA evaluate the durability of evaporative emission control systems for their useful lives, this Final Rule require each manufacturer to evaluate the durability of its evaporative emission control systems and to develop a deterioration factor for such systems. The manufacturers will then use these deterioration factors when determining whether or not their HDGs meet the appropriate standard.

Simulation of the parameters identified in the preceding paragraph is not adequately accomplished by use of the Durability Driving Schedules contained in Appendix IV to Subpart A of the regulations. The nearly continuous vehicle operation required by that schedule is not typical of the normal vehicle usage which would be expected to affect evaporative emission control system durability. Likewise, the proposed Heavy-Duty Vehicle Evaporative Emission Service Accumulation Schedule contained in Appendix XII, which is used only to stabilize an evaporative emission-data vehicle's evaporative emission control system prior to compliance testing, is also inappropriate for durability service accumulation.

It should be noted that the definition of "useful life" for gasoline-fueled HDVs has been changed since the NPRM. This change is part of the recently promulgated heavy-duty gaseous emissions package which is to be implemented in 1984 (45 FR 4136, January 21, 1980). Thus, in 1984 "useful life" will be "the average period of use up to engine retirement or rebuild, whichever occurs first, as determined by the manufacturer under §86.085–21(b)(4)(iii)(B)" of Title 40 of the Code of Federal Regulations (CFR). However, this "full-life" useful life provision is currently under review by the Agency. Any changes made to the useful life provisions will be applicable to the evaluation of evaporative emissions as well as exhaust emissions.

VII. Reporting and Recordkeeping Requirements

Because this regulation controls evaporative emissions from HDGs for the first time, there will be an increase in the industry's reporting and recordkeeping requirements. Manufacturers will have to submit descriptions of their HDGs and their evaporative emission family-control system combinations. This is currently done for other classes of mobile sources and will require a minimal effort for the first year of implementation. For successive years this description and classification of product will mostly be carried over. Also, as with other mobile source emissions regulations, the manufacturers are required to keep records of the data, analysis, etc. on which they base their statement of compliance. However, this information need not be reported unless specifically requested by EPA.

Information collection requirements contained in this regulation have been approved by the Office of Management and Budget (OMB) under the provisions of the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, and have been assigned OMB control number 2000–0390.

VIII. Administrative Designation

Under Executive Order 12291 EPA must judge whether a regulation is "major" and therefore subject to the requirement of a Regulatory Impact Analysis. This regulation is not major because it involves only a minor negative cost impact and has no significant adverse effect on competition, productivity, investment, employment, or innovation. However, the Agency has voluntarily prepared a Regulatory Support Document (located in the public docket) to assess the environmental and economic impacts of this rulemaking.This action was submitted to the Office of Management and Budget for review as required by Executive Order 12291.

IX. List of Subjects in 40 CFR Part 86

Administrative practice and procedure, Labeling, Motor vehicle pollution, Reporting and recordkeeping requirements.

Note.—In addition to establishing new requirements for gasoline-fueled heavy-duty vehicles to meet evaporative emission standards, the following rule (40 CFR Part 86, Subpart A) also republishes all existing provisions of the subpart which apply, by their own terms, in model year 1985. It should be noted, however, that the existing HC and CO requirements for heavy-duty engines, which are being republished today, are the subject of a NPRM published January 13, 1982 (47 FR 1643). Today's action does not imply that EPA has made any final decision on the January 13, 1982 proposal.

(Secs. 202(a), 206(b)(1)(C), 208, and 301(a) of the Clean Air Act, as amended (42 U.S.C. 7521, 7525, 7527, and 7601))

Dated: December 29, 1982.

John W. Hernandez,
Acting Administrator.

PART 86—[AMENDED]

40 CFR Part 86, Subpart A, is amended to read as follows:

1. The title of Subpart A is revised to read as follows:

Subpart A—General Provisions for Emission Regulations for 1977 and Later Model Year New Light-Duty Vehicles, 1977 and Later Model Year New Light-Duty Trucks, 1977 and Later Model Year New Heavy-Duty Engines, and for 1985 and Later Model Year New Gasoline-Fueled Heavy-Duty Vehicles

2. A new § 86.085–2 is added to read as follows:

§ 86.085–2 Definitions.

(a) The definitions of § 86.084–2 remain effective. The definitions listed in this section apply beginning with the 1985 model year.

"Incomplete gasoline-fueled heavy-duty vehicle" means any gasoline-fueled heavy-duty vehicle which does not have the primary load-carrying device, or passenger compartment, or engine compartment or fuel system attached.

3. A new § 86.085–10 is added to read as follows:

§ 86.085–10 Emission standards for 1985 and later model year gasoline-fueled heavy-duty engines and vehicles.

(a)(1) Exhaust emissions from new 1984 and later model year gasoline-fueled heavy-duty engines shall not exceed:

(i) *Hydrocarbons.* 1.3 grams per brake horsepower hour, as measured under transient operating conditions.

(ii) *Carbon monoxide.* (A) 15.5 grams per brake horsepower hour, as measured under transient operating conditions.

(B) 0.47 percent of the exhaust gas flow at curb idle.

(iii) *Oxides of nitrogen.* 10.7 grams per brake horsepower hour, as measured under transient operating conditions.

(2) The standards set forth in paragraph (a)(1) of this section refer to the exhaust emitted over operating schedules set forth in Subparts N or P and measured and calculated in accordance with those procedures.

(b)(1) Evaporative emissions from 1985 and later model-year gasoline-fueled heavy-duty vehicles shall not exceed:

(i) *Hydrocarbons.* (A) For vehicles with a Gross Vehicle Weight Rating of up to 14,000 pounds, 3.0 grams per test.

(B) For vehicles with a Gross Vehicle Weight Rating of greater than 14,000 pounds, 4.0 grams per test.

(2)(i) For vehicles with a Gross Vehicle Weight Rating of up to 26,000 pounds, the standards set forth in paragraph (b)(1) of this section refer to a composite sample of fuel evaporative emissions collected under the conditions set forth in Subpart M and measured in accordance with those procedures.

(ii) For vehicles with a Gross Vehicle Weight Rating of greater than 26,000 pounds, the standard set forth in paragraph (b)(1)(i)(B) of this section refers to the manufacturer's engineering design evaluation using good engineering practice (a statement of which is required in § 86.085–23(b)(4)(ii)).

(c) No crankcase emissions shall be discharged into the ambient atmosphere from any new 1985 model year gasoline-fueled heavy-duty engine.

(d) Every manufacturer of new motor vehicle engines subject to the standards prescribed in this section shall, prior to taking any of the actions specified in section 203(a)(1) of the Act, test or cause to be tested motor vehicle engines in accordance with applicable procedures in Subparts N or P of this part to ascertain that such test engines meet the requirements of paragraphs (a) and (c) of this section.

4. A new § 86.085–20 is added to read as follows:

§ 86.085–20 Incomplete vehicles, classification.

(a) An incomplete truck less than 8,500 pounds gross vehicle weight rating shall be classified by the manufacturer as a light-duty truck or as a heavy-duty vehicle. Incomplete light-duty trucks shall be described in the manufacturer's application for certification. The frontal area and curb weight used for certification purposes shall be specified on the label required in § 86.085–35(d). Incomplete heavy-duty trucks must be labeled as required in § 86.085–35(e) and § 86.085–35(g).

5. A new § 86.085–21 is added to read as follows:

§ 86.085–21 Application for certification.

(a) A separate application for a certificate of conformity shall be made for each set of standards and each class of new motor vehicles or new motor vehicle engines. Such application shall be made to the Administrator by the manufacturer and shall be updated and corrected by amendment.

(b) The application shall be in writing, signed by an authorized representative of the manufacturer, and shall include the following:

(1)(i) Identification and description of the vehicles (or engines) covered by the application and a description of their engine (vehicles only), emission control system and fuel system components. This shall include a detailed description of each auxiliary emission control device (AECD) to be installed in or on any certification test vehicle (or certification test engine).

(ii)(A) The manufacturer shall provide to the Administrator in the preliminary application for certification:

(*1*) A list of those parameters which are physically capable of being adjusted (including those adjustable parameters for which access is difficult) and that, if adjusted to settings other than the manufacturer's recommended setting, may affect emissions;

(*2*) A specification of the manufacturer's intended physically adjustable range of each such parameter, and the production tolerances of the limits or stops used to

establish the physically adjustable range;

(3) A description of the limits or stops used to establish the manufacturer's intended physically adjustable range of each adjustable parameter, or any other means used to inhibit adjustment;

(4) The nominal or recommended setting, and the associated production tolerances, for each such parameter.

(B) The manufacturer may provide, in the preliminary application for certification, information relating to why certain parameters are not expected to be adjusted in actual use and to why the physical limits or stops used to establish the physically adjustable range of each parameter, or any other means used to inhibit adjustment, are expected to be effective in preventing adjustment of parameters on in-use vehicles to settings outside the manufacturer's intended physically adjustable ranges. This may include results of any tests to determine the difficulty of gaining access to an adjustment or exceeding a limit as intended or recommended by the manufacturer.

(C) The Administrator may require to be provided detailed drawings and descriptions of the various emission related components, and/or hardware samples of such components, for the purpose of making his determination of which vehicle or engine parameter will be subject to adjustment for new certification and Selective Enforcement Audit testing and of the physically adjustable range for each such vehicle or engine parameter.

(2) Projected U.S. sales data sufficient to enable the Administrator to select a test fleet representative of the vehicles (or engines) for which certification is requested. The sales data shall also include the altitude of intended sale for light-duty trucks.

(3) A description of the test equipment and fuel proposed to be used.

(4)(i) For light-duty vehicles and light-duty trucks, a description of the test procedures to be used to establish the evaporative emission deterioration factors required to be determined and supplied in § 86.085–23(b)(2).

(ii) For gasoline-fueled heavy-duty vehicles, the Administrator does not assume that each evaporative emission family-evaporative emission control system combination will deteriorate in a unique manner during the useful life of the vehicle. The manufacturer shall therefore identify those evaporative emission deterioration factors which shall be applied to the various evaporative emission family-evaporative emission control system combinations which are expected to exhibit similar deterioration characteristics during the useful life of the vehicle.

(iii)(A) A description of the test procedures to be used to establish the durability data or the exhaust emission deterioration factors required to be determined and supplied in § 86.084–23(b)(1).

(B)(*1*) A statement of the useful life of use of each light-duty truck engine family and heavy-duty engine family up to engine retirement or rebuild (which ever occurs first) as determined by the manufacturer on the basis of the following:

(*i*) For existing engine families, survey information on in-service vehicles (or engines) or;

(*ii*) For new engine families, durability testing of prototype vehicles (or engines) or a combination of bench-type component life evaluations and survey information on similar previous vehicles (or engines).

(*2*) The manufacturer shall not determine an engine family's useful life to be less than thte basic period of the mechanical warranty on the engine assembly. This useful life shall be expressed as a period of engine or vehicle operation or as an equivalent vehicle mileage (or both) and shall be consistent with the rebuild criteria specified in paragraph (b)(4)(iii)(C) of this paragraph. The manufacturer shall include in the application the data or information on which it based its determination of the useful life.

(C) For each light-duty truck engine family and heavy-duty engine family, a statement of the criteria which are to be used in determining the need for engine rebuild and their critical values, including the following:

(*1*) The minimum cylinder compression for any one cylinder and for any two cylinders, in pounds per square inch (or kilopascals). Compression shall be measured without the addition of oil or another fluid into the cylinder.

(*2*) The maximum rate of engine lubricant oil usage by the engine, in quarts per 1,000 miles (or quarts per 30 hours).

(*3*) The maximum mass of foreign metal in the crankcase, in grams per quart of crankcase oil.

(*4*) Any other measurable indicator(s) of engine condition approved by the Administrator and the critical value(s) which signal(s) the need for a rebuild.

(*5*)(*i*) A statement of recommended maintenance and procedures necessary to assure that the vehicles (or engines) covered by a certificate of conformity in operation conform to the regulations, and a description of the program for training of personnel for such maintenance, and the equipment required.

(*ii*) A description of vehicle adjustments or modifications necessary, if any, to assure that light-duty trucks covered by a certificate of conformity conform to the regulations while being operated at any altitude locations, and a statement of the altitude at which the adjustments or modifications apply.

(*6*) At the option of the manufacturer, the proposed composition of the emission-data test fleet or (where applicable) the durability-data test fleet.

(c) Complete copies of the application and of any amendments thereto, and all notifications under §§ 86.079–32, 86.079–33, and 86.079–34 shall be submitted in such multiple copies as the Administrator may require.

(d) Incomplete light-duty trucks shall have a maximum completed curb weight and maximum completed frontal area specified by the manufacturer.

(e) For gasoline-fueled heavy-duty vehicles the manufacturer shall specify a maximum nominal fuel tank capacity for each evaporative emission family-evaporative emission control system combination.

6. A new § 86.085–22 is added to read as follows:

§ 86.085–22 Approval of application for certification; test fleet selections; determinations of parameters subject to adjustment for certification and Selective Enforcement Audit, adequacy of limits, and physically adjustable ranges.

(a) After a review of the application for certification and any other information which the Administrator may require, the Administrator may approve the application and select a test fleet in accordance with § 86.084–24.

(b) The Administrator may disapprove in whole or in part an application for certification for reasons including incompleteness, inaccuracy, inappropriate proposed mileage (or service) accumulation procedures, test equipment, or fuel, and incorporation of defeat devices in vehicles (or on engines) described by the application.

(c) Where any part of an application is rejected, the Administrator shall notify the manufacturer in writing and set forth the reasons for such rejection. Within 30 days following receipt of such notification, the manufacturer may request a hearing on the Administrator's determination. The request shall be in writing, signed by an authorized representative of the manufacturer and shall include a statement specifying the manufacturer's objections to the Administrator's determinations, and

data in support of such objections. If, after the review of the request and supporting data, the Administrator finds that the request raises a substantial factual issue, he shall provide the manufacturer a hearing in accordance with § 86.078–6 with respect to such issue.

(d)(1) The Administrator does not approve the test procedures for establishing the evaporative emission deterioration factors for light-duty vehicles and light-duty trucks. The manufacturer shall submit the procedures as required in § 86.084–21(b)(4)(i) prior to the Administrator's selection of the test fleet under § 86.084–24(b)(1) and if such procedures will involve testing of durability-data vehicles selected by the Administrator or elected by the manufacturer under § 86.084–24(c)(1), prior to initiation of such testing.

(2) *Light-duty trucks and heavy-duty engines only.* The Administrator does not approve the test procedures for establishing exhaust emission deterioration factors the manufacturer's determination of the average period of use, nor the manufacturer's determination of the values of the rebuilt criteria. The manufacturer shall submit these procedures and determinations as required in § 86.084–21(b)(4)(iii) prior to determining the deterioration factors.

(3) *Gasoline-fueled heavy-duty vehicles only.* The Administrator does not approve the test procedures for establishing the evaporative emission deterioration factors. The test procedure will conform to the requirements in § 86.085–23(b)(3).

(e) When the Administrator selects emission-data vehicles for the test fleet, he will at the same time determine those vehicle or engine parameters which will be subject to adjustment for certification, Selective Enforcement Audit and Production Compliance Audit testing, the adequacy of the limits, stops, seals, or other means used to inhibit adjustment, and the resulting physically adjustable ranges for each such parameter and notify the manufacturer of his determinations.

(1)(i) The Administrator may determine to be subject to adjustment the idle fuel-air mixture, idle speed, and initial spark timing parameters on gasoline-fueled vehicles (or engines) (carbureted or fuel injected); the choke valve action parameter(s) on carbureted, gasoline-fueled vehicles (or engines); or any parameter on any vehicle (or engine) (diesel or gasoline-fueled) which is physically capable of being adjusted, may significantly affect emissions, and was not present on the manufacturer's vehicles (or engines) in the previous model year in the same form and function.

(ii) The Administrator may, in addition, determine to be subject to adjustment any other parameters on any vehicle or engine which is physically capable of being adjusted and which may significantly affect emissions. However, the Administrator may do so only if he has previously notified the manufacturer that he might do so and has found, at the time he gave this notice, that the intervening period would be adequate to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period. In no event will this notification be given later than September 1 of the calendar year two years prior to the model year.

(iii) In determining the parameters subject to adjustment the Administrator will consider the likelihood that, for each of the parameters listed in paragraphs (e)(1)(i) and (e)(1)(ii) of this section, settings other than the manufacturer's recommended setting will occur on in-use vehicles (or engines). In determining likelihood, the Administrator may consider such factors as, but not limited to, information contained in the preliminary application, surveillance information from similar in-use vehicles (or engines), the difficulty and cost of gaining access to an adjustment, damage to the vehicle (or engine) if an attempt is made to gain such access and the need to replace parts following such attempt, and the effect of settings other than the manufacturer's recommended setting on vehicle (or engine) performance characteristics including emission characteristics.

(2)(i) The Administrator shall determine a parameter to be adequately inaccessible or sealed if:

(A) In the case of an idle mixture screw, the screw is recessed within the carburetor casting and sealed with lead, thermosetting plastic, or an inverted elliptical spacer or sheared off after adjustment at the factory, and the inaccessibility is such that the screw cannot be accessed and/or adjusted with simple tools in one-half hour or for $20 (1978 dollars) or less.

(B) In the case of a choke bimetal spring, the plate covering the bimetal spring is riveted or welded in place, or held in place with nonreversible screws.

(C) In the case of a parameter which may be adjusted by elongating or bending adjustable members (e.g., the choke vacuum break), the elongation of the adjustable member is limited by design or, in the case of a bendable member, the member is constructed of a material which when bent would return to its original shape after the force is removed (plastic or spring steel materials).

(D) In the case of any parameter, the manufacturer demonstrates that adjusting the parameter to settings other than the manufacturer's recommended setting takes more than one-half hour or costs more than $20 (1978 dollars).

(ii) The Administrator shall determine a physical limit or stop to be an adequate restraint on adjustability if:

(A) In the case of a threaded adjustment, the threads are terminated, pinned or crimped so as to prevent additional travel without breakage or need for repairs which take more than one-half hour or cost more than $20 (1978 dollars).

(B) The adjustment is ineffective at the end of the limits of travel regardless of additional forces or torques applied to the adjustment.

(C) The manufacturer demonstrates that travel or rotation limits cannot be exceeded with the use of simple and inexpensive tools (screwdriver, pliers, open-end or box wrenches, etc.) without incurring significant and costly damage to the vehicle (or engine) or control system or without taking more than one-half hour or costing more than $20 (1978 dollars).

(iii) If manufacturer service manuals or bulletins describe routine procedures for gaining access to a parameter or for removing or exceeding a physical limit, stop, seal or other means used to inhibit adjustment, or if surveillance data indicate that gaining access, removing, or exceeding is likely, paragraphs (e)(2)(i) and (e)(2)(ii) of this section shall not apply for that parameter.

(iv) In determining the adequacy of a physical limit, stop, seal, or other means used to inhibit adjustment of a parameter not covered by paragraph (e)(2)(i) or (e)(2)(ii) of this section, the Administrator will consider the likelihood that it will be circumvented, removed, or exceeded on in-use vehicles. In determining likelihood, the Administrator may consider such factors as, but not limited to, information contained in the preliminary application; surveillance information from similar in-use vehicles (or engines); the difficulty and cost of circumventing, removing, or exceeding the limit, stop, seal, or other means; damage to the vehicle (or engine) if an attempt is made to circumvent, remove, or exceed it and the need to replace parts following such attempt; and the effect of settings beyond the limit, stop, seal, or other means on vehicle (or engine)

performance characteristics other than emission characteristics.

(3) The Administrator shall determine two physically adjustable ranges for each parameter subject to adjustment:

(i)(A) In the case of a parameter determined to be adequately inaccessible or sealed, the Administrator may include within the physically adjustable range applicable to testing under this subpart (certification testing) all settings within the production tolerance associated with the nominal setting for that parameter, as specified by the manufacturer in the preliminary application for certification.

(B) In the case of other parameters, the Administrator shall include within this range all settings within physical limits or stops determined to be adequate restraints on adjustability. The Administrator may also include the production tolerances on the location of these limits or stops when determining the physically adjustable range.

(ii)(A) In the case of a parameter determined to be adequately inaccessible or sealed, the Administrator shall include within the physically adjustable range applicable to testing under Subpart G or K (Selective Enforcement Audit and Production Compliance Audit) only the actual settings to which the parameter is adjusted during production.

(B) In the case of other parameters, the Administrator shall include within this range all settings within physical limits or stops determined to be adequate restraints on adjustability, as they are actually located on the test vehicle (or engine).

(f)(1) If the manufacturer submits the information specified in § 86.084–21(b)(1)(ii) in advance of its full preliminary application for certification, the Administrator shall review the information and make the determinations required in paragraph (e) of this section within 90 days of the manufacturer's submittal.

(2) The 90-day decision period is exclusive of the elapsed time during which EPA may request additional information from manufacturers regarding an adjustable parameter and the receipt of the manufacturers' response(s).

(g) Within 30 days following receipt of notification of the Administrator's determinations made under paragraph (e) of this section, the manufacturer may request a hearing on the Administrator's determinations. The request shall be in writing, signed by an authorized representative of the manufacturer, and shall include a statement specifying the manufacturer's objections to the Administrator's determinations, and data in support of such objections. If, after review of the request and supporting data, the Administrator finds that the request raises a substantial factual issue, he shall provide the manufacturer a hearing in accordance with § 86.078–6 with respect to such issue.

7. A new § 86.085–23 is added to read as follows:

§ 86.085–23 Required data.

(a) The manufacturer shall perform the tests required by the applicable test procedures, and submit to the Administrator the following information: *Provided, however,* that if requested by the manufacturer, the Administrator may waive any requirement of this section for testing of vehicle (or engine) for which emission data are available or will be made available under the provisions of § 86.081–29.

(1) [Reserved]

(2) [Reserved]

(b)(1)(i) Exhaust emission durability data on such light-duty vehicles tested in accordance with applicable test procedures and in such numbers as specified, which will show the performance of the systems installed on or incorporated in the vehicle for extended mileage, as well as a record of all pertinent maintenance performed on the test vehicles.

(ii) Exhaust emission deterioration factors for light-duty trucks and heavy-duty engines and all test data that are derived from the testing described under § 86.084–21(b)(4)(iii)(A) as well as a record of all pertinent maintenance. Such testing shall be designed and conducted in accordance with good engineering practice to assure that the engines covered by a certificate issued under § 86.084–30 will meet the emission standards in §§ 86.084–09, 86.084–10, or 86.084–11 as appropriate, in actual use for the useful life of the engine.

(2) For light-duty vehicles and light-duty trucks, evaporative emission deterioration factors for each evaporative emission family-evaporative emission control system combination and all test data that are derived from testing described under § 86.084–21(b)(4)(i) designed and conducted in accordance with good engineering practice to assure that the vehicles covered by a certificate issued under § 86.084–30 will meet the evaporative emission standards in § 86.081–8 or § 86.084–9, as appropriate, for the useful life of the vehicle.

(3) For gasoline-fueled heavy-duty vehicles, evaporative emission deterioration factors for each evaporative emission family-evaporative emission control system combination identified in accordance with § 86.085–21(b)(4)(ii). Furthermore, a statement that the test procedure(s) used to derive the deterioration factors includes, but need not be limited to, a consideration of the ambient effects of ozone and temperature fluctuations, and the service accumulation effects of vibration, time, and vapor saturation and purge cycling. The deterioration factor test procedure shall be designed and conducted in accordance with good engineering practice to assure that the vehicles covered by a certificate issued under § 86.085–30 will meet the evaporative emission standards in § 86.085–10 in actual use for the useful life of the engine. Furthermore, a statement that a description of the test procedure, as well as all data, analyses and evaluations, is available to the Administrator upon request.

(4)(i) For gasoline-fueled, heavy-duty vehicles with a Gross Vehicle Weight Rating of up to 26,000 pounds, a written statement to the Administrator certifying that the manufacturer's vehicles meet the standards of § 86.085–10 as determined by the provisions of § 86.085–28. Furthermore, a written statement to the Administrator that all data, analyses, test procedures, evaluations, and other documents, on which the above statement is based, are available to the Administrator upon request.

(ii) For gasoline-fueled, heavy-duty vehicles with a Gross Vehicle Weight Rating of greater than 26,000 pounds, a written statement to the Administrator certifying that the manufacturer's evaporative emission control systems are designed, using good engineering practice, to meet the standards of § 86.085–10 as determined by the provisions of § 86.085–28. Furthermore, a written statement to the Administrator that all data, analyses, test procedures, evaluations, and other documents, on which the above statement is based, are available to the Administrator upon request.

(c) *Emission data.* (1)(i) Emission data on such vehicles tested in accordance with applicable test procedures and in such numbers as specified. These data shall include zero-mile data, if generated, and emission data generated for certification as required under § 86.084–26(a)(3)(i) or § 86.084–26(a)(3)(ii).

(ii) [Reserved]

(2) *Certification engines.* Emission data on such engines tested in accordance with applicable emission test procedures of this subpart and in such numbers as specified. These data shall include zero-hour data, if

generated, and emission data generated for certification as required under § 86.082–26(b)(5). In lieu of providing emission data on CO emissions from diesel certification engines the Administrator may, on request of the manufacturer, allow the manufacturer to demonstrate (on the basis of previous emission tests, development tests, or other information) that the engine will conform with the CO emission standard of § 86.084–11.

(d) A statement that the vehicles (or engines) for which certification is requested conform to the requirements in § 86.078–5(b), and that the descriptions of tests performed to ascertain compliance with the general standards in § 86.078–5(b), and the data derived from such tests, are available to the Administrator upon request.

(e)(1) A statement that the test vehicles (or test engines) with respect to which data are submitted to demonstrate compliance with the applicable standards of this subpart are in all material respects as described in the manufacturer's application for certification, have been tested in accordance with the applicable test procedures utilizing the fuels and equipment described in the application for certification and that on the basis of such tests the vehicles (or engines) conform to the requirements of this part. If such statements cannot be made with respect to any vehicle (or engine) tested, the vehicle (or engine) shall be identified, and all pertinent data relating thereto shall be supplied to the Administrator. If, on the basis of the data supplied and any additional data as required by the Administrator, the Administrator determines that the test vehicles (or test engine) was not as described in the application for certification or was not tested in accordance with the applicable test procedures utilizing the fuels and equipment as described in the application for certification, the Administrator may make the determination that the vehicle (or engine) does not meet the applicable standards. The provisions of § 86.084–30(b) shall then be followed.

(2) For evaporative emission durability, or light-duty truck or heavy-duty engine exhaust emission durability, a statement of compliance with paragraph (b)(2), (b)(3) or (b)(1)(ii) of this section, as applicable.

8. A new § 86.085–24 is added to read as follows:

§ 86.085–24 Test vehicles and engines.

(a)(1) The vehicles or engines covered by an application for certification will be divided into groupings of engines which are expected to have similar emission characteristics throughout their useful life. Each group of engines with similar emission characteristics shall be defined as a separate engine family.

(2) To be classed in the same engine family, engines must be identical in all the following respects:

(i) The cylinder bore center-to-center dimensions.

(ii) [Reserved]

(iii) [Reserved]

(iv) The cylinder block configuration (air cooled or water cooled; L–6, 90° V–8, etc.).

(v) The location of the intake and exhaust valves (or ports).

(vi) The method of air aspiration.

(vii) The combustion cycle.

(viii) Catalytic converter characteristics.

(ix) Thermal reactor characteristics.

(x) Type of air inlet cooler (e.g., intercoolers and after-coolers) for diesel heavy-duty engines.

(3)(i) Engines identical in all the respects listed in paragraph (a)(2) of this section may be further divided into different engine families if the Administrator determines that they may be expected to have different emission characteristics. This determination will be based upon a consideration of the following features of each engine:

(A) The bore and stroke.

(B) The surface-to-volume ratio of the nominally dimensioned cylinder at the top dead center positions.

(C) The intake manifold induction port size and configuration.

(D) The exhaust manifold port size and configuration.

(E) The intake and exhaust valve sizes.

(F) The fuel system.

(G) The camshaft timing and ignition or injection timing characteristics.

(ii) Light-duty trucks and heavy-duty engines produced in different model years and distinguishable in the respects listed in paragraph (a)(2) of this section shall be treated as belonging to a single engine family if the Administrator requires it, after determining that the engines may be expected to have similar emission deterioration characteristics.

(4) Where engines are of a type which cannot be divided into engine families based upon the criteria listed in paragraphs (a)(2) and (a)(3) of this section, the Administrator will establish families for those engines based upon those features most related to their emission characteristics. Engines that are eligible to be included in the same engine family based on the criteria in paragraphs (a)(2) and (a)(3)(i) of this section may be further divided into different engine families if the manufacturer determines that they may be expected to have different emission characteristics. This determination will be based upon a consideration of the following features of each engine:

(i) The dimension from the center line of the crankshaft to the center line of the camshaft.

(ii) The dimension from the center line of the crankshaft to the top of the cylinder block head face.

(iii) The size of the intake and exhaust valves (or ports).

(5) The gasoline-fueled light-duty vehicles and light-duty trucks covered by an application for certification will be divided into groupings which are expected to have similar evaporative emission characteristics throughout their useful life. Each group of vehicles with similar evaporative emission characteristics shall be defined as a separate evaporative emission family.

(6) For gasoline-fueled light-duty vehicles and light-duty trucks to be classed in the same evaporative emission family, vehicles must be similar with respect to:

(i) Type of vapor storage device (e.g., canister, air cleaner, crankcase).

(ii) Basic canister design.

(iii) Fuel system.

(7) Where vehicles are of a type which cannot be divided into evaporative emission families based on the criteria listed above, the Administrator will establish families for those vehicles based upon the features most related to their evaporative emission characteristics.

(8)(i) If the manufacturer elects to participate in the Alternative Durability Program, the engine families covered by an application for certification shall be grouped based upon similar engine design and emission control system characteristics. Each of these groups shall constitute a separate engine family group.

(ii) To be classed in the same engine family group, engine families must contain engines identical in all of the following respects:

(A) The combustion cycle.

(B) The cylinder block configuration (air-cooled or water-cooled; L–6, V–8, rotary, etc.).

(C) Displacement (engines of different displacement within 50 cubic inches or 15 percent of the largest displacement and contained within a multidisplacement engine family will be included in the same engine family group).

(D) Catalytic converter usage and basic type (noncatalyst, oxidation catalyst only, three-way catalyst equipped).

(9) Engine families identical in all respects listed in paragraph (a)(8) of this section may be further divided into different engine family groups if the Administrator determines that they are expected to have significantly different exhaust emission control system deterioration characteristics.

(10) A manufacturer may request the Administrator to include in an engine family group, engine families in addition to those grouped under the provisions of paragraph (a)(8) of this section. This request must be accompanied by information the manufacturer believes supports the inclusion of these additional engine families.

(11) A manufacturer may combine into a single engine family group those light-duty vehicle and light-duty truck engine families which otherwise meet the requirements of paragraphs (a)(8) through (a)(10) of this section.

(12) The gasoline-fueled heavy-duty vehicles covered by an application for certification will be divided into groupings of vehicles on the basis of physical features which are expected to affect evaporative emissions. Each group of vehicles with similar features shall be defined as a separate evaporative emission family.

(13) For gasoline-fueled heavy-duty vehicle to be classed in the same evaporative emission family, vehicles must be identical with respect to:

(i) Method of fuel/air metering (i.e., carburetion versus fuel injection).

(ii) Carburetor bowl fuel volume, within a 10 cc range.

(14) For gasoline-fueled heavy-duty vehicles to be classed in the same evaporative emission control system, vehicles must be identical with respect to:

(i) Method of vapor storage.

(ii) Method of carburetor sealing.

(iii) Method of air cleaner sealing.

(iv) Vapor storage working capacity, within a 20g range.

(v) Number of storage devices.

(vi) Method of purging stored vapors.

(vii) Method of venting the carburetor during both engine off and engine operation.

(viii) Liquid fuel hose material.

(ix) Vapor storage material.

(15) Where gasoline-fueled heavy-duty vehicles are types which cannot be divided into evaporative emission family-control system combinations based on the criteria listed above, the Administrator will establish evaporative emission family-control system combinations for those vehicles based on features most related to their evaporative emission characteristics.

(b) Emission data:

(1) *Emission-data vehicles.* Paragraph (b)(1) of this section applies to light-duty vehicle and light-duty truck emission-data vehicles.

(i) Vehicles will be chosen to be operated and tested for emission data based upon engine family groupings. Within each engine family, one test vehicle will be selected based on the following criteria: The Administrator shall select the vehicle with the heaviest equivalent test weight (including options) within the family. Then within that vehicle the Administrator shall select, in the order listed, the highest road-load power, largest displacement, the transmission with the highest numerical final gear ratio (including overdrive), the highest numerical axle ratio offered in that engine family and the maximum fuel flow calibration.

(ii) The Administrator shall select one additional test vehicle from within each engine family. The vehicle selected shall be the vehicle expected to exhibit the highest emissions of those vehicles remaining in the engine family. If all vehicles within the engine family are similar the Administrator may waive the requirements of this paragraph.

(iii) Within an engine family and exhaust emission control system, the manufacturer may alter any emission-data vehicle (or other vehicles such as including current or previous model year emission-data vehicles, fuel economy data vehicles, and development vehicles provided they meet emission-data vehicles' protocol) to represent more than one selection under paragraph (b)(1) (i), (ii), (iv), or (vii) of this section.

(iv) If the vehicles selected in accordance with paragraphs (b)(1) (i) and (ii) of this section do not represent each engine-system combination, then one vehicle of each engine-system combination not represented will be selected by the Administrator. The vehicle selected shall be the vehicle expected to exhibit the highest emissions of those vehicles remaining in the engine family.

(v) For high-altitude exhaust emission compliance for each engine family, the manufacturer shall follow one of the following procedures:

(A) The manufacturer will select for testing under high-altitude conditions the vehicle expected to exhibit the highest emissions from the nonexempt vehicles selected in accordance with § 86.084–24(b)(1) (ii), (iii), and (iv) of this section or,

(B) In lieu of testing vehicles according to paragraph (A) of this section, a manufacturer may provide a statement in its application for certification that, based on the manufacturer's engineering evaluation of such high-altitude emission testing as the manufacturer deems appropriate,

(*1*) [Reserved]

(*2*) that light-duty trucks sold for principal use at designated high-altitude locations comply with the high-altitude emission requirements and, that all other light-duty trucks sold at low altitude and not exempt under § 86.084–9(g)(2) are capable of being modified to meet high-altitude standards.

(vi) If 90 percent or more of the engine family sales will be in California, a manufacturer may substitute emission-data vehicles selected by the California Air Resources Board criteria for the selections specified in paragraphs (b)(1)(i), (b)(1)(ii), and (b)(1)(iv) of this section.

(vii)(A) Vehicles of each evaporative emission family will be divided into evaporative emission control systems.

(B) The Administrator will select the vehicle expected to exhibit the highest evaporative emissions, from within each evaporative family to be certified, from among the vehicles represented by the exhaust emission-data selections for the engine family, unless evaporative testing has already been completed on the vehicle expected to exhibit the highest evaporative emissions for the evaporative family as part of another engine family's testing.

(C) If the vehicles selected in accordance with paragraph (b)(1)(vii)(B) of this section do not represent each evaporative emission control system then the Administrator will select the highest expected evaporative emission vehicle from within the unrepresented evaporative system.

(viii) For high-altitude evaporative emission compliance for each evaporative emission family, the manufacturer shall follow one of the following procedures:

(A) The manufacturer will select for testing under high-altitude conditions the one nonexempt vehicle previously selected under paragraphs (b)(1)(vii) (B) or (C) of this section which is expected to have the highest level of evaporative emissions when operated at high altitude or

(B) In lieu of testing vehicles according to paragraph (A) of this section, a manufacturer may provide a statement in its application for certification that based on the manufacturer's engineering evaluation of such high-altitude emission testing as the manufacturer deems appropriate,

(*1*) [Reserved]

(*2*) that light-duty trucks sold for principal use at designated high-altitude locations comply with the high-altitude emission requirements and that all other

light-duty trucks sold at low altitude and not exempt under § 86.084–9(g)(2) are capable of being modified to meet high-altitude standards.

(ix) Vehicles selected under paragraph (b)(1)(v)(A) of this section may be used to satisfy the requirements of (b)(1)(viii)(A) of this section.

(x) (Light-Duty Trucks Only) (A) The manufacturer may reconfigure any of the low-altitude emission-data vehicles to represent the vehicle configuration required to be tested at high altitude.

(B) The manufacturer is not required to test the reconfigured vehicle at low altitude.

(2) *Gasoline-fueled heavy-duty emission-data engines.* Paragraph (b)(2) of this section applies to gasoline-fueled heavy-duty engines.

(i) [Reserved]

(ii) [Reserved]

(iii) The Administrator shall select a maximum of two engines within each engine family based upon features indicating that they may have the highest emission levels of the engines in the engine family as follows:

(A) The Administrator shall select one emission-data engine first based on the largest displacement within the engine family. Then within the largest displacement the Administrator shall select, in the order listed, highest fuel flow at the speed of maximum rated torque, the engine with the most advanced spark timing, no EGR or lowest EGR flow, and no air pump or lowest actual flow air pump.

(B) The Administrator shall select one additional engine, from within each engine family. The engine selected shall be the engine expected to exhibit the highest emissions of those engines remaining in the engine family. If all engines within the engine family are similar the Administrator may waive the requirements of this paragraph.

(iv) If the engines selected in accordance with paragraph (b)(2) (ii) and (iii) of this section do not represent each engine displacement-exhaust emission control system combination, then one engine of each engine displacement-exhaust emission control system combination not represented shall be selected by the Administrator.

(v) Within an engine family and emission control system, the manufacturer may alter any emission-data engine to represent more than one selection under paragraph (b)(2) (iii) and (iv) of this section.

(3) *Diesel heavy-duty emission-data engines.* Paragraph (b)(3) of this section applies to diesel heavy-duty emission-data vehicles.

(i) Engines will be chosen to be run for emission data based upon engine family groupings. Within each engine family, the requirements of this paragraph must be met.

(ii) Engines of each engine family will be divided into groups based upon their exhaust emission control systems. One engine of each engine system combination shall be run for smoke emission data and gaseous emission data. Either the complete gaseous emission test or the complete smoke test may be conducted first. Within each combination, the engine that features the highest fuel feed per stroke, primarily at the speed of maximum rated torque and secondarily at rated speed, will usually be selected. If there are military engines with higher fuel rates than other engines in the same engine system combinations, then one military engine shall also be selected. The engine with the highest fuel feed per stroke will usually be selected.

(iii) The Administrator may select a maximum of one additional engine within each engine-system combination based upon features indicating that it may have the highest emission levels of the engines of that combination. In selecting this engine, the Administrator will consider such features as the injection system, fuel system, compression ratio, rated speed, rated horsepower, peak torque speed, and peak torque.

(c) *Durability data:* (1) *Light-duty vehicle durability-data vehicles.* Paragraph (c)(1) of this section applies to light-duty vehicle durability-data vehicles.

(i) A durability-data vehicle will be selected by the Administrator to represent each engine-system combination. The vehicle selected shall be of the engine displacement with the largest projected sales volume of vehicles with that control-system combination in that engine family and will be designated by the Administrator as to transmission type, fuel system, inertia weight class, and test weight.

(ii) A manufacturer may elect to operate and test additional vehicles to represent any engine-system combination. The additional vehicles must be of the same engine displacement, transmission type, fuel system and inertia weight class as the vehicle selected for that engine-system combination in accordance with the provisions of paragraph (c)(1)(i) of this section. Notice of an intent to operate and test additional vehicles shall be given to the Administrator no later than 30 days following notification of the test fleet selection.

Light-duty trucks. Paragraph (c)(2) of this section applies to vehicles, engines, subsystems, or components used to establish exhaust emission deterioration factors for light-duty trucks.

(i) The manufacturer shall select the vehicles, engines, subsystems, or components to be used to determine exhaust emission deterioration factors for each engine-family control system combination. Whether vehicles, engines, subsystems, or components are used, they shall be selected so that their emissions deterioration characteristics may be expeced to represent those of in-use vehicles, based on good engineering judgment.

(ii) [Reserved]

(3) *Heavy-duty engines.* Paragraph (c)(3) of this section applies to engines, subsystems, or components used to establish exhaust emission deterioration factors for heavy-duty engines.

(i) The manufacturer shall select the engines, subsystems, or components to be used to determine exhaust emission deterioration factors for each engine-family control system combination. Whether engines, subsystems, or components are used, they shall be selected so that their emissions deterioration characteristics may be expected to represent those of in-use engines, based on good engineering judgment.

(ii) [Reserved]

(d) For purposes of testing under § 86.084–26 (a)(9) or (b)(11), the Administrator may require additional emission-data vehicles (or emission-data engines) and durability-data vehicles (light-duty vehicles only) identical in all material respects to vehicles (or engines) selected in accordance with paragraphs (b) and (c) of this section, *Provided* that the number of vehicles (or engines) selected shall not increase the size of either the emission-data fleet or the durability-data fleet by more than 20 percent or one vehicle (or engine), whichever is greater.

(e)(1) Any manufacturer whose projected sales for the model year in which certification is sought is less than:

(i) 2,000 gasoline-fueled light-duty vehicles, or

(ii) 2,000 diesel light-duty vehicles, or

(iii) 2,000 gasoline-fueled light-duty trucks, or

(iv) 2,000 diesel light-duty trucks, or

(v) 2,000 gasoline-fueled heavy-duty engines, or

(vi) 2,000 diesel heavy-duty engines,

may request a reduction in the number of test vehicles (or engines) determined in accordance with the foregoing provisions of this section. The Administrator may agree to such lesser number as he determines would meet the objectives of this procedure.

(2) Any manufacturer may request to certify engine families with combined total sales of fewer than 10,000 light-duty vehicles, light-duty trucks, and heavy-duty engines utilizing assigned deterioration factors prescribed by the Administrator. The assigned deterioration factors shall be applied only to entire engine families.

(f) In lieu of testing an emission-data or durability-data vehicle (or engine) selected under paragraph (b) or (c) of this section, and submitting data therefor, a manufacturer may, with the prior written approval of the Administrator, submit exhaust emission data and/or fuel evaporative emission data, as applicable on a similar vehicle (or engine) for which certification has previously been obtained or for which all applicable data required under § 86.084–23 has previously been submitted.

(g)(1) This paragraph applies to light-duty vehicles and light-duty trucks, but does not apply to the production vehicles selected under paragraph (h) of this section.

(2) Where it is expected that more than 33 percent of the vehicles in an engine family will be equipped with an optional item, the full estimated weight of that item shall be included, if required by the Administrator, in the curb weight computation for each vehicle available with that option in the engine family. Where it is expected that 33 percent or less of the vehicles in an engine family will be equipped with an item of optional equipment, no weight for that item will be added in computing curb weight. In the case of mutually exclusive options, only the weight of the heavier option will be added in computing curb weight. Optional equipment weighing less than 3 pounds per item need not be considered.

(3)(i) Where it is expected that more than 33 percent of a car line within an engine-system combination will be equipped with an item of optional equipment that can reasonably be expected to influence emissions, then such items shall actually be installed (unless excluded under paragraph (g)(3)(ii) of this section) on all emission-data and durability-data vehicles of that car line, within that engine-system combination, on which the items are intended to be offered in production. Optional equipment that can reasonably be expected to influence emissions are the air conditioner, power steering, power brakes and other items determined by the Administrator.

(ii) If the manufacturer determines by test data or engineering evaluation that the actual installation of the optional equipment required by paragraph (g)(3)(i) of this section does not affect the emissions or fuel economy values, the optional equipment need not be installed on the test vehicle. The weight of the options shall be included in the design curb weight and also be represented in the weight of the test vehicles. The engineering evaluation, including any test data, used to support the deletion of optional equipment from test vehicles, shall be maintained by the manufacturer and shall be made available to the Administrator upon request.

(h) *Alternative Durability Program durability-data vehicles.* Paragraph (h) of this section applies to light-duty vehicle and light-duty truck durability-data vehicles selected under the Alternative Durability Program. The Alternative Durability Program is described in § 86.081–13.

(1) In order to update the durability data to be used to determine a deterioration factor for each engine family group, the Administrator will select durability-data vehicles from the manufacturer's production line. Production vehicles will be selected from the 1981, 1982, and 1983 model year production of vehicles.

(i) The Administrator shall select the production durability-data vehicle designs from the designs that the manufacturer offers for sale. For each model year and for each engine family group, the Administrator may select production durabilty-data vehicle designs of equal number to the number of engine families within the engine family group, up to a maximum of three vehicles.

(ii) The production durability-data vehicles representing the designs selected in paragraph (h)(1)(i) of this section will be randomly selected from the manufacturer's production. The Administrator will make these random selections unless the manufacturer (with prior approval of the Administrator) elects to make the random selections.

(iii) The manufacturer may select additional production durability-data vehicle designs from within the engine family group. The production durability-data vehicles representing these designs shall be randomly selected from the manufacturer's production in accordance with paragraph (h)(1)(ii) of this section.

(iv) For each production durability-data vehicle selected under paragraph (h)(1) of this section, the manufacturer shall provide to the Administrator (before the vehicle is tested or begins service accumulation) the vehicle identification number. Before the vehicle begins service accumulation the manufacturer shall also provide the Administrator with a description of the durability-data vehicle as specified by the Administrator.

(2) If, within an existing engine family group, a manufacturer requests to certify vehicles of a new design, engine family, emission control system, or with any other durability-related design difference, the Administrator will determine if the existing engine family group deterioration factor is appropriate for the new design. If the Administrator cannot make this determination or deems the deterioration factor not appropriate, the Administrator shall select preproduction durability-data vehicles under the provisions of paragraph (c) of this section. If vehicles are then certified using the new design, the Administrator may select production vehicles with the new design under the provisions of paragraph (h)(1) of this section.

(3) If a manufacturer requests to certify vehicles of a new design that the Administrator determines are a new engine family group, the Administrator shall select preproduction durability-data vehicles under the provisions of paragraph (c) of this section. If vehicles are then certified using the new design, the Administrator may select production vehicles of that design under the provisions of paragraph (h)(1) of this section.

9. A new § 86.085–27 is added to read as follows:

§ 86.085–27 Special test procedures.

(a) The Administrator may, on the basis of a written application by a manufacturer, prescribe test procedures, other than those set forth in this part, for any light-duty vehicle, light-duty truck, heavy-duty engine, or gasoline-fueled heavy-duty vehicle which the Administrator determines is not susceptible to satisfactory testing by the procedures set forth in this part.

(b) If the manufacturer does not submit a written application for use of special test procedures but the Administrator determines that a light-duty vehicle, light-duty truck, heavy-duty engine, or gasoline-fueled heavy-duty vehicle is not susceptible to satisfactory testing by the procedures set forth in this part, the Administrator shall notify the manufacturer in writing and set forth the reasons for such rejection in accordance with the provisions of § 86.082–22(c).

10. A new paragraph (d) is added to § 86.085–28 to read as follows:

§ 86.085–28 Compliance with emission standards.

* * * * *

(d)(1) Paragraph (d) of this section applies to gasoline-fueled heavy-duty vehicles.

(2) The applicable fuel evaporative emission standard in § 86.085–10 applies to the emissions of vehicles for their useful life.

(3)(i) For vehicles with a GVWR of up to 26,000 pounds because it is expected that emission control efficiency will change during the useful life of the vehicle, an evaporative emission deterioration factor shall be determined from the testing described in § 86.085–23(b)(3) for each evaporative emission family-evaporative emission control system combination to indicate the evaporative emission control system deterioration during the useful life of the vehicle (minimum 50,000 miles). The factor shall be established to a minimum of two places to the right of the decimal.

(ii) For vehicles with a GVWR of greater than 26,000 pounds; because it is expected that emission control efficiency will change during the useful life of the vehicle, each manufacturer's statement as required in § 86.085–23(b)(4)(ii) shall include, in accordance with good engineering practice, consideration of control system deterioration.

(4) The evaporative emission test results, if any, shall be adjusted by the addition of the appropriate deterioration factor: *Provided,* that if the deterioration factor as computed in paragraph (c)(3) of this section is less than zero, that deterioration factor shall be zero for the purposes of this paragraph.

(5) The emission level to compare with the standard shall be the adjusted emission level of paragraph (c)(4) of this section. Before any emission value is compared with the standard, it shall be rounded, in accordance with ASTME 29–67, to two significant figures. The rounded emission values may not exceed the standard.

(6) Every test vehicle of an evaporative emission family must comply with the evaporative emission standard, as determined in paragraph (c)(5) of this section, before any vehicle in that family may be certified.

11. A new § 86.085–29 is added to read as follows:

§ 86.085–29 Testing by the Administrator.

(a)(1) Paragraph (a) of this section applies to light-duty vehicles and light-duty trucks.

(2) The Administrator may require that any one or more of the test vehicles be submitted to him, at such place or places as he may designate, for the purposes of conducting emissions tests. The Administrator may specify that he will conduct such testing at the manufacturer's facility, in which case instrumentation and equipment specified by the Administrator shall be made available by the manufacturer for test operations. Any testing conducted at a manufacturer's facility pursuant to this paragraph shall be scheduled by the manufacturer as promptly as possible.

(3)(i) Whenever the Administrator conducts a test on a test vehicle, the results of that test shall, unless subsequently invalidated by the Administrator, comprise the official data for the vehicle at the prescribed test point and the manufacturer's data for that prescribed test point shall not be used in determining compliance with emission standards.

(ii) Whenever the Administrator does not conduct a test on a test vehicle at a test point, the manufacturer's test data will be accepted as the official data for that point: *Provided,* that if the Administrator makes a determination based on testing under paragraph (a)(2) of this section, that there is a lack of correlation between the manufacturer's test equipment and the test equipment used by the Administrator, no manufacturer's test data will be accepted for purposes of certification until the reasons for the lack of correlation are determined and the validity of the data is established by the manufacturer, *and further provided,* that if the Administrator has reasonable basis to believe that any test data submitted by the manufacturer is not accurate or has been obtained in violation of any provisions of this part, the Administrator may refuse to accept that data as the official data pending retesting or submission or further information. If the manufacturer conducts more than one test on a vehicle, as authorized under § 86.084–26 (a)(3)(i)(A) or (b)(4)(i)(A), the data from the last test in that series of tests on that vehicle, will constitute the official data.

(iii)(A)(*1*) The Administrator may adjust or cause to be adjusted any adjustable parameter of an emission data vehicle or engine which the Administrator has determined to be subject to adjustment for certification and Selective Enforcement Audit testing in accordance with § 86.084–22(e)(1), to any setting within the physically adjustable range of that parameter, as determined by the Administrator in accordance with § 86.084–22(e)(3)(i), prior to the performance of any tests to determine whether such vehicle or engine conforms to applicable emission standards, including tests performed by the manufacturer under § 86.084–23(c)(1). However, if the idle speed parameter is one which the Administrator has determined to be subject to adjustment, the Administrator shall not adjust it to a setting which causes a higher engine idle speed than would have been possible within the physically adjustable range of the idle speed parameter on the vehicle before it accumulated any mileage, all other parameters being adjusted identically for the purpose of comparison. The Administrator, in making or specifying such adjustments, will consider the effect of the deviation from the manufacturer's recommended setting on emissions performance characteristics as well as the likelihood that similar settings will occur on in-use light-duty vehicles or light-duty trucks. In determining likelihood, the Administrator will consider factors such as, but not limited to, the effect of the adjustment on vehicle performance characteristics and surveillance information from similar in-use vehicles.

(*2*) For those vehicles or engine parameters which the Administrator has not determined to be subject to adjustment during certification and Selective Enforcement Audit testing in accordance with § 86.084–22(e)(1), the emission-data vehicle presented to the Administrator for testing shall be calibrated within the production tolerances applicable to the manufacturer's specifications to be shown on the vehicle label (see § 86.084–35(a)(1)(iii)(D) or (a)(2)(iii)(D)) as specified in the application for certification. If the Administrator determines that a vehicle is not within such tolerances, the vehicle will be adjusted, at the facility designated by the Administrator, prior to the test and an engineering report shall be submitted to the Administrator describing the corrective action taken. Based on the engineering report, the Administrator will determine if the vehicle will be used as an emission-data vehicle.

(B) If the Administrator determines that the test data developed on an emission-data vehicle under paragraph (a)(3)(i) of this section would cause that vehicle to fail due to excessive 4,000 mile emissions or by application of the appropriate deterioration factor, then the following procedure shall be observed:

(*1*) The manufacturer may request a retest. Before the retest, those vehicle or engine parameters which the Administrator has not determined to be subject to adjustment for certification and Selective Enforcement Audit testing in accordance with § 86.063–22(e)(1) may be readjusted to manufacturer's specification, if these adjustments were made incorrectly prior to the first test. The Adminstrator may adjust or cause

to be adjusted any parameter which the Administrator has determined to be subject to adjustment to any setting within the physically adjustable range of that parameter, as determined by the Administrator in accordance with § 86.084–22(e)(3)(i). However, if the idle speed parameter is one which the Administrator has determined to be subject to adjustment, the Administrator shall not adjust it to a setting which causes a higher engine idle speed than would have been possible within the physically adjustable range of the idle speed parameter on the vehicle before it accumulated any mileage, all other parameters being adjusted identically for the purpose of comparison. Other maintenance or repairs may be performed in accordance with § 86.084–25. All work on the vehicle shall be done at such location and under such conditions as the Administrator may prescribe.

(*2*) The vehicle will be retested by the Administrator and the results of this test shall comprise the official data for the emission-data vehicle.

(iv) If sufficient durability data are not available at the time of any emission test conducted under paragraph (a)(2) of this section to enable the Administrator to determine whether an emission-data vehicle would fail, the manufacturer may request a retest in accordance with the provisions of paragraphs (a)(3)(iii) (A) and (B) of this section. If the manufacturer does not promptly make such request, he shall be deemed to have waived the right to a retest. A request for retest must be made before the manufacturer removes the vehicle from the test premises.

(b)(1) Paragraph (b) of this section applies to heavy-duty engines.

(2) The Administrator may require that any one or more of the test engines be submitted to him, at such place or places as he may designate, for the purpose of conducting emissions tests. The Administrator may specify that he will conduct such testing at the manufacturer's facility, in which case instrumentation and equipment specified by the Administrator shall be made available by the manufacturer for test operations. Any testing conducted at a manufacturer's facility pursuant to this paragraph shall be scheduled by the manufacturer as promptly as possible.

(3)(i) Whenever the Administrator conducts a test on a test engine the results of that test, unless subsequently invalidated by the Administrator, shall comprise the official data for the engine at that prescribed test point and the manufacturer's data for that prescribed test point shall not be used in determining compliance with emission standards.

(ii) Whenever the Administrator does not conduct a test on a test engine at a test point, the manufacturer's test data will be accepted as the official data for that test point: *Provided,* that if the Administrator makes a determination based on testing under paragraph (b)(2) of this section, that there is a lack of correlation between the manufacturer's test equipment and the test equipment used by the Administrator, no manufacturer's test data will be accepted for purposes of certification until the reasons for the lack of correlation are determined and the validity of the data is established by the manufacturer: *And further provided,* that if the Administrator has reasonable basis to believe that any test data submitted by the manufacturer is not accurate or has been obtained in violation of any provision of this part, the Administrator may refuse to accept that data as the official data pending retesting or submission of further information.

(iii)(A)(*1*) The Administrator may adjust or cause to be adjusted any adjustable parameter of an emission-data engine which the Administrator has determined to be subject to adjustment for certification testing in accordance with § 86.084–22(e)(1), to any setting within the physically adjustable range of that parameter, as determined by the Administrator in accordance with § 86.084–22(e)(3)(i), prior to the performance of any tests to determine whether such engine conforms to applicable emission standards, including tests performed by the manufacturer under § 86.084–23(c)(2). However, if the idle speed parameter is one which the Administrator has determined to be subject to adjustment, the Administrator shall not adjust it to a setting which causes a higher engine idle speed than would have been possible within the physically adjustable range of the idle speed parameter on the engine before it accumulated any dynamometer service, all other parameters being identically adjusted for the purpose of the comparison. The Administrator, in making or specifying such adjustments, may consider the effect of the deviation from the manufacturer's recommended setting on emissions performance characteristics as well as the likelihood that similar settings will occur on in-use heavy-duty engines. In determining likelihood, the Administrator may consider factors such as, but not limited to, the effect of the adjustment on engine performance characteristics and surveillance information from similar in-use engines.

(*2*) For those engine parameters which the Administrator has not determined to be subject to adjustment for certification testing in accordance with § 86.084–22(e)(1), the emission-data engine presented to the Administrator for testing shall be calibrated within the production tolerances applicable to the manufacturer's specifications to be shown on the engine label (see § 86.084–35(a)(3)(iii)) as specified in the application for certification. If the Administrator determines that an engine is not within such tolerances, the engine shall be adjusted at the facility designated by the Administrator prior to the test and an engineering report shall be submitted to the Administrator describing the corrective action taken. Based on the engineering report, the Administrator will determine if the engine shall be used as an emission-data engine.

(B) If the Administrator determines that the test data developed under paragraph (b)(3)(iii)(A) of this section would cause the emission-data engine to fail due to excessive 125-hour emission values or by the application of the appropriate deterioration factor, then the following procedure shall be observed:

(*1*) The manufacturer may request a retest. Before the retest, those engine parameters which the Administrator has not determined to be subject to adjustment for certification testing in accordance with § 86.084–22(e)(1) may be readjusted to the manufacturer's specifications, if these adjustments were made incorrectly prior to the first test. The Administrator may adjust or cause to be adjusted any parameter which the Administrator has determined to be subject to adjustment in accordance with § 86.084–22(e)(3)(i). However, if the idle speed parameter is one which the Administrator has derermined to be subject to adjustment, the Administrator shall not adjust it to a setting which causes a higher engine idle speed than would have been possible within the physically adjustable range of the idle speed parameter on the engine before it accumulated any dynamometer service, all other parameters being identically adjusted for the purpose of the comparison. Other maintenance or repairs may be performed in accordance with § 86.084–25. All work on the vehicle shall be done at such location and under such conditions as the Administrator may prescribe.

(*2*) The engine will be retested by the Administrator and the results of this test

shall comprise the official data for the emission-data engine.

(iv) If sufficient durability data are not available at the time of any emission test conducted under paragraph (b)(2) of thid section to enable the Administrator to determine whether an emission-data engine would fail, the manufacturer may request a retest in accordance with the provisions of paragraph (b)(3)(iii)(B) (1) and (2) of this section. If the manufacturer does not promptly make such request, he shall be deemed to have waived the right to a retest. A request for retest must be made before the manufacturer removes the engine from the test premises.

(c)(1) Paragraph (c) of this section applies to gasoline-fueled heavy-duty vehicles.

(2) The Administrator may require that any one or more of the evaporative emission family-system combinations included in the manufacturer's statement(s) of compliance be installed on an appropriate vehicle and such vehicle be submitted to him, at such place or places as he may designate, for the purpose of conducting emissions tests. The Administrator may specify that he will conduct such testing at the manufacturer's facility, in which case instrumentation and equipment specified by the Administrator shall be made available by the manufacturer for test operations. Any testing conducted at a manufacturer's facility pursuant to this paragraph shall be scheduled by the manufacturer as promptly as possible.

(3)(i) Whenever the Administrator conducts a test on an evaporative emission family-system combination the results of that test, unless subsequently invalidated by the Administrator, shall comprise the official data for the evaporative emission family-system combination and the manufacturer's data, analyses, etc. shall not be used in determining compliance with emission standards.

(ii) Whenever the Administrator does not conduct a test on an evaporative emission family-system combination, the manufacturer's test data will be accepted as the official data: *Provided,* that if the Administrator makes a determination based on testing under paragraph (c)(2) of this section, that there is a lack of correlation between the manufacturer's test equipment and the test equipment used by the Administrator, no manufacturer's test data will be accepted for purposes of certification until the reasons for the lack of correlation are determined and the validity of the data is established by the manufacturer: *And further provided,* that if the Administrator has reasonable basis to believe that any test data, analyses, or other information submitted by the manufacturer is not accurate or has been obtained in violation of any provision of this part, the Administrator may refuse to accept that data, analyses, etc. as the official data pending retesting or submission of further information.

12. A new § 86.085–30 is added to read as follows:

§ 86.085–30 Certification.

(a)(1)(i) If, after a review of the test reports and data submitted by the manufacturer, data derived from any inspection carried out under § 86.078–7(c), and any other pertinent data or information, the Administrator determines that a test vehicle(s) (or test engine(s)) meet(s) the requirements of the Act and of this subpart, he will issue a certificate of conformity with respect to such vehicle(s) (or engine(s)) except in cases covered by paragraphs (a)(1)(ii) and (c) of this section.

(ii) *Gasoline-fueled heavy-duty vehicles.* If, after a review of the statement(s) of compliance submitted by the manufacturer under § 86.085–23(b)(4) and any other pertinent data or information, the Administrator determines that the requirements of the Act and this subpart have been met, he will issue one certificate of conformity per manufacturer with respect to the evaporative emission family(s) covered by such statement(s) except in cases covered by paragraph (c) of this section.

(2) Such certificate will be issued for such period not to exceed one model year as the Administrator may determine and upon such terms as he may deem necessary or appropriate to assure that any new motor vehicle (or new motor vehicle engine) covered by the certificate will meet the requirements of the Act and of this part.

(3)(i) One such certificate will be issued for each engine family. For gasoline-fueled light-duty vehicles and light-duty trucks, one such certificate will be issued for each engine family-evaporative emission family combination.

(A) *Light-Duty Vehicles.* Each certificate will certify compliance with no more than one set of standards.

(B) *Light-Duty Trucks.* Each certificate will certify compliance with no more than one set of standards except for low-altitude standards and high-altitude standards. The certificate shall state that it covers vehicles sold or delivered to an ultimate purchaser for principal use at a designated high-altitude location only if the vehicle conforms in all material respects to the design specifications that apply to those vehicles described in the application for certification at high altitude.

(ii) For gasoline-fueled heavy-duty vehicles, one such certificate will be issued for each manufacturer and will certify compliance for those vehicles previously identified in that manufacturer's statement(s) of compliance as required in § 86.085–23(b)(4)(i) and (ii).

(4) The adjustment or modification of any light-duty truck, in accordance with instructions provided by the manufacturer for the altitude where the vehicle is principally used will not be considered violation of Section 203(a)(3) of the Clean Air Act. A violation of Section 203(a)(1) of the Clean Air Act occurs when any manufacturer sells or delivers to an ultimate purchaser any light-duty truck, subject to the regulations under the Act, which is not configured to meet high-altitude requirements:

(i) At a designated high-altitude location, unless such manufacturer has substantial reason to believe that such motor vehicle will not be used principally at a designated high-altitude location; or

(ii) At an other than designated high-altitude location, when such manufacturer has reason to believe that such motor vehicle will be used principally at a designated high-altitude location.

(5) For the purpose of paragraph (a) of this section, "designated high-altitude location" is any county which has substantially all of its area located above 1,219 meters (4,000 feet) and which is identified below:

Counties Located Substantially Above 1,219 Meters (4,000 Feet) in Elevation

State of Arizona

Apache	Navajo
Cochise	Yavapai
Coconino	

State of Colorado

Adams	Cheyenne
Alamosa	Clear Creek
Arapahoe	Conejos
Archuleta	Costilla
Boulder	Crowley
Chaffee	Custer
Delta	Garfield
Denver	Gilpin
Dolores	Grand
Douglas	Gunnison
Eagle	Hinsdale
Elbert	Huerfano
El Paso	Jackson
Fremont	Jefferson
Kit Carson	Mesa
Lake	Mineral
La Plata	Moffat
Larimer	Montezuma
Las Animas	Montrose
Lincoln	Morgan

Otero	Saguache
Ouray	San Juan
Park	San Miguel
Pitkin	Summit
Pueblo	Teller
Rio Blanco	Washington
Rio Grande	Weld
Routt	

State of Idaho

Bannock	Camas
Bear Lake	Carribou
Bingham	Cassia
Blaine	Cark
Bonneville	Custer
Butte	
Franklin	Minidoka
Fremont	Oneida
Jefferson	Power
Lemhi	Teton
Madison	Valley

State of Montana

Beaverhead	Madison
Deer Lodge	Meagher
Gallatin	Park
Jefferson	Silver Bow
Judith Basin	Wheatland
Powell	

State of Nebraska

Banner	Kimball
Cheyenne	Sioux

State of Nevada

Carson City	Lyon
Douglas	Mineral
Elko	Nye
Esmeralda	Pershing
Eureka	Storey
Humboldt	Washoe
Lander	White Pine
Lincoln	

State of New Mexico

Bernalillo	De Baca
Catron	Grant
Colfax	Guadalupe
Curry	
Harding	Luna
Hidalgo	McKinley
Lincoln	Otero
Los Alamos	
Mora	Sierra
Rio Arriba	Socorro
Roosevelt	Taos
Sandoval	Torrance
San Juan	Union
San Miguel	Valencia
Santa Fe	

State of Oregon

Harney	Klamath
Lake	

State of Texas

Jeff Davis	Parmer
Hudspeth	

State of Utah

Beaver	Daggett
Box Elder	Davis
Cache	Duchesne
Carbon	Emery
Garfield	Kane
Grand	Millard
Iron	Morgan
Juab	
Piute	Tooele
Rich	Uintah
Salt Lake	Utah
San Juan	Wasatch
Sanpete	Wayne
Sevier	Weber
Summit	

State of Wyoming

Albany	Natrona
Cambell	Niobrara
Carbon	Park
Converse	Platte
Fremont	Sublette
Goshen	Sweetwater
Hot Springs	Teton
Johnson	Uinta
Laramie	Washakie
Lincoln	Weston

(6) [Reserved]

(7) Catalyst-equipped vehicles, otherwise covered by a certificate, which are driven outside the United States, Canada, and Mexico will be presumed to have been operated on leaded gasoline resulting in deactivation of the catalysts. If these vehicles are imported or offered for importation without retrofit of the catalyst, they will be considered not to be within the coverage of the certificate unless included in a catalyst control program operated by a manufacturer or a United States Government agency and approved by the Administrator.

(8) For incomplete light-duty trucks, a certificate covers only those new motor vehicles which, when completed by having the primary load-carrying device or container attached, conform to the maximum curb weight and frontal area limitations described in the application for certification as required in § 86.084–21(d).

(9) For heavy-duty engines, a certificate covers only those new motor vehicle engines installed in heavy-duty vehicles which conform to the minimum gross vehicle weight rating, curb weight, or frontal area limitations for heavy-duty vehicles described in § 86.082–2.

(10) For incomplete gasoline-fueled heavy-duty vehicles a certificate covers only those new motor vehicles which, when completed, conform to the nominal maximum fuel tank capacity limitations as described in the applicaton for certification as required in § 86.085–21(e).

(b)(1) The Administrator will determine whether a vehicle (or engine) covered by the application complies with applicable standards by observing the following relationships:

(i) *Light-duty vehicles.* (A) The durability-data vehicle(s) selected under § 86.084–24(c)(1)(i) shall represent all vehicles of the same engine-system combination.

(B) The emission-data vehicle(s) selected under § 86.084–24(b)(1) (ii) through (b)(1)(iv) shall represent all vehicles of the same engine-system combination as applicable.

(C) The emission-data vehicle(s) selected under § 86.084–24 (b)(1)(vii)(A) and (b)(1)(vii)(B) shall represent all vehicles of the same evaporative control system within the evaporative family.

(ii) *Light-duty trucks.*

(A) [Reserved]

(B) The emission-data vehicle(s) selected under § 86.084–24(b)(1)(ii), shall represent all vehicles of the same engine-system combination as applicable.

(C) The emission-data vehicle(s) selected under § 86.084–24 (b)(1)(vii)(A) and (b)(1)(vii)(B) shall represent all vehicles of the same evaporative control system within the evaporative family.

(D) The emission-data vehicle(s) selected under § 86.084–24(b)(1)(v) shall represent all vehicles of the same engine-system combination as applicable.

(E) The emission-data vehicle(s) selected under § 86.084–24(b)(1)(viii) shall represent all vehicles of the same evaporative control system within the evaporative emission family, as applicable.

(iii) *Heavy-duty engines.* (A) A gasoline-fueled emission-data test engine selected under § 86.080–24(b)(2)(ii) and (iv) shall represent all engines in the same family of the same engine displacement-exhaust emission control system combination.

(B) A gasoline-fueled emission-data test engine selected under § 86.080–24(b)(2)(iii) shall represent all engines in the same engine family of the same engine displacement-exhaust emission control system combination.

(C) A diesel emission-data test engine selected under § 86.084–24(b)(3)(ii) shall represent all engines in the same engine-system combination.

(D) A diesel emission-data test engine selected under § 86.084–24(b)(3)(iii) shall represent all engines of that emission control system at the rated fuel delivery of the test engine.

(E) [Reserved]

(iv) *Gasoline-fueled heavy-duty vehicles.* A statement of compliance submitted under § 86.085–23(b)(4)(i) or § 86.085–23(b)(4)(ii) shall represent all vehicles in the same evaporative emission family-evaporative emission control system combination.

(2) The Adminstrator will proceed as in paragraph (a) of this section with respect to the vehicles (or engines) belonging to an engine family or engine family-evaporative emission family

combination (as applicable), all of which comply with all applicable standards.

(3) If, after a review of the test reports and data submitted by the manufacturer, data derived from any additional testing conducted pursuant to § 86.084–29, data or information derived from any inspection carried out under § 86.078–7(c) or any other pertinent data or information, the Administrator determines that one or more test vehicles (or test engines) of the certification test fleet do not meet applicable standards, he will notify the manufacturer in writing, setting forth the basis for his determination. Within 30 days following receipt of the notification, the manufacturer may request a hearing on the Administrator's determination. The request shall be in writing, signed by an authorized representative of the manufacturer and shall include a statement specifying the manufacturer's objections to the Administrator's determination and data in support of such objections. If, after a review of the request and supporting data, the Administrator finds that the request raises a substantial factual issue, he shall provide the manufacturer a hearing in accordance with § 86.078–6 with respect to such issue.

(4) For light-duty vehicles and light-duty trucks the manufacturer may, at his option, proceed with any of the following alternatives with respect to an emission-data vehicle determined not in compliance with all applicable standards for which it was tested:

(i) Request a hearing under § 86.078–6; or

(ii) Remove the vehicle configuration (or evaporative vehicle configuration, as applicable) which failed, from his application;

(A) If the failed vehicle was tested for compliance with exhaust emissions standards only: The Administrator may select, in place of the failed vehicle, in accordance with the selection criteria employed in selecting the failed vehicle, a new emission-data vehicle to be tested for exhaust emission compliance only.

(B) If the failed vehicle was tested for compliance with both exhaust and evaporative emission standards: The Administrator may select, in place of the failed vehicle, in accordance with the selection criteria employed in selecting the failed vehicle, a new emission-data vehicle which will be tested for compliance with both exhaust and evaporative emission standards. If one vehicle cannot be selected in accordance with the selection criteria employed in selecting the failed vehicle, then two vehicles may be selected (i.e., one vehicle to satisfy the exhaust emission vehicle selection criteria and one vehicle to satisfy the evaporative emission vehicle selection criteria). The vehicle selected to satisfy the exhaust emission vehicle selection criteria will be tested for compliance with exhaust emission standards only. The vehicle selected to satisfy the evaporative emission vehicle selection criteria will be tested for compliance with both exhaust and evaporative emission standards; or

(iii) Remove the vehicle configuration (or evaporative vehicle configuration, as applicable) which failed from the application and add a vehicle configuration(s) (or evaporative vehicle configuration(s), as applicable) not previously listed. The Administrator may require, if applicable, that the failed vehicle be modified to the new engine code (or evaporative emission code, as applicable) and demonstrate by testing that it meets applicable standards for which it was originally tested. In addition, the Administrator may select, in accordance with the vehicle selection criteria given in § 86.084–24(b), a new emission-data vehicle or vehicles. The vehicles selected to satisfy the exhaust emission vehicle selection criteria will be tested for compliance with exhaust emission standards only. The vehicles selected to satisfy the evaporative emission vehicle selection criteria will be tested for compliance with both exhaust and evaporative emission standards; or

(iv) Correct a component or system malfunction and show that with a correctly functioning system or component the failed vehicle meets applicable standards for which it was originally tested. The Administrator may require a new emission-data vehicle, of identical vehicle configuration (or evaporative vehicle configuration, as applicable) to the failed vehicle, to be operated and tested for compliance with the applicable standards for which the failed vehicle was originally tested.

(5) For heavy-duty engines the manufacturer may, at his option, proceed with any of the following alternatives with respect to any engine family represented by a test engine(s) determined not in compliance with applicable standards:

(i) Request a hearing under § 86.078–6; or

(ii) Delete from the application for certification the engines represented by the failing test engine. (Engines so deleted may be included in a later request for certification under 86.079–32.) The Administrator may then select in place of each failing engine an alternate engine chosen in accordance with selecting criteria employed in selection the engine that failed; or

(iii) Modify the test engine and demonstrate by testing that it meets applicable standards. Another engine which is in all material respects the same as the first engine, as modified, may then be operated and tested in accordance with applicable test procedures.

(6) If the manufacturer does not request a hearing or present the required data under paragraphs (b)(4) or (b)(5) (as applicable) of this section, the Administrator will deny certification.

(c)(1) Notwithstanding the fact that any certification vehicle(s) (or certification engine(s)) may comply with other provisions of this subpart, the Administrator may withhold or deny the issuance of a certificate of conformity (or suspend or revoke any such certificate which has been issued) with respect to any such vehicle(s) (or engine(s)) if:

(i) The manufacturer submits false or incomplete information in his application for certification thereof;

(ii) The manufacturer renders inaccurate any test data which he submits pertaining thereto or otherwise circumvents the intent of the Act, or of this part with respect to such vehicle (or engine);

(iii) Any EPA Enforcement Officer is denied access on the terms specified in § 86.078–7(c) to any facility or portion thereof which contains any of the following:

(A) The vehicle (or engine);

(B) Any components used or considered for use in its modification or buildup into a certification vehicle (or certification engine);

(C) Any production vehicle (or production engine) which is or will be claimed by the manufacturer to be covered by the certificate;

(D) Any step in the construction of a vehicle (or engine) described in (c)(1)(iii)(C) of this section;

(E) Any records, documents, reports, or histories required by this part to be kept concerning any of the above;

(iv) Any EPA Enforcement Officer is denied "reasonable assistance" (as defined in § 86.078–7(c)) in examining any of the items listed in paragraph (c)(1)(iii) of this section.

(2) The sanctions of withholding, denying, revoking, or suspending of a certificate may be imposed for the reasons in paragraphs (c)(1)(i), (ii), (iii), or (iv) of this section only when the infraction is substantial.

(3) In any case in which a manufacturer knowingly submits false or inaccurate information or knowingly renders inaccurate or invalid any test data or commits any other fraudulent

acts and such acts contribute substantially to the Administrator's decision to issue a certificate of conformity, the Administrator may deem such certificate void ab initio.

(4) In any case in which certification of a vehicle (or engine) is proposed to be withheld, denied, revoked, or suspended under paragraph (c)(1)(iii) or (c)(1)(iv) of this section, and in which the Administrator has presented to the manufacturer involved reasonable evidence that a violation of § 86.078–7(c) in fact occurred, the manufacturer, if he wishes to contend that, even though the violation occurred, the vehicle (or engine) in question was not involved in the violation to a degree that would warrant withholding denial, revocation, or suspension of certification under either paragraph (c)(1)(iii) or (c)(1)(iv) of this section, shall have the burden of establishing that contention to the satisfaction of the Administrator.

(5) Any revocation or suspension of certification under paragraph (c)(1) of this section shall:

(i) Be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with § 86.078–6 hereof.

(ii) Extend no further than to forbid the introduction into commerce of vehicles (or engines) previously covered by the certification which are still in the hands of the manufacturer, except in cases of such fraud or other misconduct as makes the certification invalid ab initio.

(6) The manufacturer may request in the form and manner specified in paragraph (b)(3) of this section that any determination made by the Administrator under paragraph (c)(1) of this section to withhold or deny certification be reviewed in a hearing conducted in accordance with § 86.078–6. If the Administrator finds, after a review of the request and supporting data, that the request raises a substantial factual issue, he will grant the request with respect to such issue.

(d)(1) *For light-duty vehicles.* Notwithstanding the fact that any vehicle configuration or engine family may be covered by a valid outstanding certificate of conformity, the Administrator may suspend such outstanding certificate of conformity in whole or in part with respect to such vehicle configuration or engine family if:

(i) The manufacturer refuses to comply with the provisions of a test order issued by the Administrator pursuant to § 86.603; or

(ii) The manufacturer refuses to comply with any of the requirements of § 86.603; or

(iii) The manufacturer submits false or incomplete information in any report or information provided pursuant to the requirements of § 86.609; or

(iv) The manufacturer renders inaccurate any test data which he submits pursuant to § 86.609; or

(v) Any EPA Enforcement Officer is denied access to a facility on the terms specified in § 86.606; or

(vi) Any EPA Enforcement Officer is denied the opportunity on the terms specified in § 86.606, to:

(A) Monitor vehicle selection pursuant to § 86.607, or

(B) Select vehicles for testing pursuant to § 86.607, or

(C) Monitor vehicle testing performed to satisfy any of the requirements of this part; or

(vii) Any EPA Enforcement Officer is denied "reasonable assistance" as defined in § 86.606 in examining any of the items listed in that section; or

(viii) The manufacturer refuses to comply with the requirements of §§ 86.604(a), 86.605, and 86.607, 86.608, 86.610, or 86.611.

(2) The sanction of suspending a certificate may not be imposed for the reasons in paragraphs (d)(1) (i), (ii), or (viii) of this section where such refusal is caused by conditions and circumstances outside the control of the manufacturer which renders it impossible to comply with those requirements. Such conditions and circumstances shall include, but not be limited to, any uncontrollable factors which results in the temporary unavailability of equipment and personnel needed to conduct the required tests, such as equipment breakdown or failure or illness of personnel, but shall not include failure of the manufacturer to adequately plan for and provide the equipment and personnel needed to conduct the tests. The manufacturer will bear the burden of establishing the presence of the conditions and circumstances required by this paragraph.

(3) The sanctions of suspending a certificate may be imposed for the reasons in paragraphs (d)(1) (iii), (iv), (v), (vi), or (vii) of this section only when the infraction is substantial.

(4) In any case in which a manufacturer knowingly submitted false or inaccurate information or knowingly rendered inaccurate any test data or committed any other fraudulent acts, and such acts contributed substantially to the Administrator's original decision not to suspend or revoke a certificate of conformity in whole or in part, the Administrator may deem such certificate void from the date of such fraudulent act.

(5) In any case in which certification of a vehicle is proposed to be suspended under paragraph (d)(1)(v), (d)(1)(vi), or (d)(1)(vii) of this section, and in which the Administrator has presented to the manufacturer involved reasonable evidence that a violation of § 86.606 in fact occurred, the manufacturer, if he wishes to contend that even though the violation occurred, the vehicle configuration or engine family in question was not involved in the violation to the degree that would warrant suspension of certification under either paragraph (d)(1)(v), (d)(1)(vi), or (d)(1)(vii) of this section, shall have the burden of establishing that contention to the satisfaction of the Administrator.

(6) Any suspension of certification under paragraph (d)(1) of this section shall:

(i) Be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with § 86.613 hereof, and

(ii) Not apply to vehicles no longer in the hands of the manufacturer.

(e) *For light-duty trucks and heavy-duty engines.* (1) Notwithstanding the fact that any vehicle configuration or engine family may be covered by a valid outstanding certificate of conformity, the Administrator may suspend such outstanding certificate of conformity in whole or in part with respect to such vehicle or engine configuration or engine family if:

(i) The manufacturer refuses to comply with the provisions of a test order issued by the Administrator pursuant to § 86.1003; or

(ii) The manufacturer refuses to comply with any of the requirements of § 86.1003; or

(iii) The manufacturer submits false or incomplete information in any report or information provided pursuant to the requirements of § 86.1009; or

(iv) The manufacturer renders inaccurate any test data submitted pursuant to § 86.1009; or

(v) Any EPA Enforcement Officer is denied the opportunity to conduct activities related to entry and access as authorized in § 86.1006 of this part and in a warrant or court order presented to the manufacturer or the party in charge of a facility in question; or

(vi) EPA Enforcement Officers are unable to conduct activities related to entry and access as authorized in § 86.1006 of this part because a manufacturer has located a facility in a foreign jurisdiction where local law prohibits those activities; or

(vii) The manufacturer refuses to or in fact does not comply with the requirements of §§ 86.1004(a), 86.1005, 86.1007, 86.1008, 86.1010, 86.1011, or 86.1013.

(2) The sanction of suspending a certificate may not be imposed for the reasons in paragraphs (e)(1) (i), (ii), or (vii) of this section where such refusal or denial is caused by conditions and circumstances outside the control of the manufacturer which renders it impossible to comply with those requirements. Such conditions and circumstances shall include, but are not limited to, any uncontrollable factors which result in the temporary unavailability of equipment and personnel needed to conduct the required tests, such as equipment breakdown or failure or illness of personnel, but shall not include failure of the manufacturers to adequately plan for and provide the equipment and personnel needed to conduct the tests. The manufacturer will bear the burden of establishing the presence of the conditions and circumstances required by this paragraph.

(3) The sanction of suspending a certificate may be imposed for the reasons outlined in paragraph (e)(1), (iii), (iv), or (v) of this section only when the infraction is substantial.

(4) In any case in which a manufacturer knowingly submitted false or inaccurate information or knowingly rendered inaccurate any test data or committed any other fraudulent acts, and such acts contributed substantially to the Administrator's original decision not to suspend or revoke a certificate of conformity in whole or in part, the Administrator may deem such certificate void from the date of such fraudulent act.

(5) In any case in which certification of a light-duty truck or heavy-duty engine is proposed to be suspended under paragraph (e)(1)(v) of this section and in which the Administrator has presented to the manufacturer involved reasonable evidence that a violation of § 86.1006 in fact occurred, if the manufacturer wishes to contend that, although the violation occurred, the vehicle or engine configuration or engine family in question was not involved in the violation to a degree that would warrant suspension of certification under paragraph (e)(1)(v) of this section, he shall have the burden of establishing that contention to the satisfaction of the Administrator.

(6) Any suspension of certification under paragraph (e)(1) of this section shall:

(i) Be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with § 86.1014 and

(ii) Not apply to vehicles or engines no longer in the hands of the manufacturer.

(7) Any voiding of a certificate of conformity under paragraph (e)(4) of this section shall be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with § 86.1014.

13. A new § 86.085–35 is added to read as follows:

§ 86.085–35 Labeling.

(a) The manufacturer of any motor vehicle (or motor vehicle engine) subject to the applicable emission standards of this subpart, shall, at the time of manufacture, affix a permanent legible label, of the type and in the manner described below, containing the information hereinafter provided, to all production models of such vehicles (or engines) available for sale to the public and covered by a certificate of conformity under § 86.084–30(a).

(1) *Light-duty vehicles.* (i) A permanent, legible label shall be affixed in a readily visible position in the engine compartment.

(ii) The label shall be affixed by the vehicle manufacturer who has been issued the certificate of conformity for such vehicle, in such a manner that it cannot be removed without destroying or defacing the label. The label shall not be affixed to any equipment which is easily detached from such vehicle.

(iii) The label shall contain the following information lettered in the English language in block letters and numerals, which shall be of a color that contrasts with the background of the label:

(A) The label heading: Vehicle Emission Control Information;

(B) Full corporate name and trademark of manufacturer;

(C) Engine displacement (in cubic inches), engine, family identification and evaporative family identification;

(D) Engine tune-up specifications and adjustments, as recommended by the manufacturer in accordance with the applicable emission standards, including but not limited to idle speed(s), ignition timing, the idle air-fuel mixture setting procedure and value (e.g., idle CO, idle air-fuel ratio, idle speed drop), high idle speed, initial injection timing, and valve lash (as applicable), as well as other parameters deemed necessary by the manufacturer. These specifications should indicate the proper transmission position during tune-up and what accessories (e.g., air conditioner), if any, should be in operation. If adjustments or modifications to the vehicle are necessary to insure compliance with either the emission standards at low altitude or the optional emission standards at high altitude, the manufacturer shall either include the instructions for such adjustments on the label, or indicate on the label where instructions for such adjustments may be found. The label shall indicate whether the engine tune-up or adjustment specifications are applicable to elevation below or above 4,000 feet.

(E) An unconditional statement of compliance with the appropriate model year U.S. Environmental Protection Agency regulations which apply to light-duty vehicles;

(2) Light-duty trucks. (i) A legible, permanent label shall be affixed in a readily visible position in the engine compartment.

(ii) The label shall be affixed by the vehicle manufacturer who has been issued the certificate of conformity for such vehicle, in such a manner that it cannot be removed without destroying or defacing the label. The label shall not be affixed to any equipment which is easily detached from such vehicle.

(iii) The label shall contain the following information lettered in the English language in block letters and numerals, which shall be of a color that contrasts with the background of the label.

(A) The label heading: Important Vehicle Information;

(B) Full corporate name and trademark of manufacturers;

(C) Engine displacement (in cubic inches) and engine family identification;

(D) Engine tune-up specifications and adjustments, as recommended by the manufacturer in accordance with the applicable emission standards, including but not limited to idle speed(s), ignition timing, the idle air-fuel mixture setting procedure and value (e.g., idle CO, idle air-fuel ratio, idle speed drop), high idle speed, initial injection timing, and valve lash (as applicable), as well as other parameters deemed necessary by the manufacturer. These specifications should indicate the proper transmission position during tune-up and what accessories (e.g., air conditioner), if any, should be in operation. If adjustments or modifications to the vehicle are necessary to insure compliance with emission standards at either high or low altitude, the manufacturer shall either include the instructions for such adjustments on the label, or indicate on the label where instructions for such adjustments may be found. The label shall indicate whether the engine tune-up or adjustment specifications are

applicable to high altitude, low altitude or both.

(E) The prominent statement: "(Manufacturer's corporate name) has determined this vehicle has an average useful life of —— miles or —— hours of operation, whichever occurs first." The manufacturer may alter this statement only to express the useful life in terms other than miles or hours (e.g., years, or hours only).

(F) The subordinate addition to the statement in paragraph (a)(2)(iii)(E) of this section: "This engine's actual life may vary depending on its service application. (For additional information see the owner's maintenance instructions.) This engine conforms to U.S. EPA regulations applicable to 19— Model Year New Heavy-Duty Engines for its useful life."

(G) A statement, if applicable, that the adjustments or modifications indicated on the label are necessary to ensure emission control compliance at the altitude specified.

(H) A statement, if applicable, that the high-altitude vehicle was designated or modified for principal use at high altitude. This statement must be affixed by the manufacturer at the time of assembly or by any dealer who performs the high-altitude modification or adjustment prior to sale to an ultimate purchaser.

(I) A statement, if applicable, that the vehicle has been exempted from meeting the high-altitude gaseous emission standards as specified in § 86.084–9(g)(4) or § 86.085–9(g)(2), as applicable, and that its unsatisfactory performance under high-altitude conditions makes it unsuitable for principal use at high altitude.

(J) A statement, if applicable, that the vehicle has been exempted from meeting the high-altitude gaseous emissions standards as specified in § 86.084–9(g)(2) and, as a consequence, the emission performance warranty provisions of 40 CFR Part 85, Subpart V do not apply when the vehicle is tested at high altitude.

(3) Heavy-duty engines. (i) A permanent legible label shall be affixed to the engine in a position in which it will be readily visible after installation in the vehicle.

(ii) The label shall be attached to an engine part necessary for normal engine operation and not normally requiring replacement during engine life.

(iii) The label shall contain the following information lettered in the English language in block letters and numerals which shall be of a color that contrasts with the background of the label:

(A) The label heading: Important Engine Information;

(B) Full corporate name and trademark of manufacturer;

(C) Engine displacement (in cubic inches) and engine family and model designations;

(D) Date of engine manufacture (month and year). The manufacturer may, in lieu of including the date of manufacture on the engine label, maintain a record of the engine manufacture dates. The manufacturer shall provide the date of manufacture records to the Administrator upon request;

(E) Engine specifications and adjustments as recommended by the manufacturer. These specifications should indicate the proper transmission position during tuneup and what accessories (e.g., air conditioner), if any, should be in operation;

(F) For gasoline-fueled engines the label should include the idle speed, ignition timing, and the idle air-fuel mixture setting procedure and value (e.g., idle CO, idle air-fuel ratio, idle speed drop), and valve lash;

(G) For diesel engines the label should include the advertised hp at rpm, fuel rate at advertised hp in mm3 stroke, valve lash, initial injection timing, and idle speed;

(H) The prominent statement: "(Manufacturer's corporate name) has determined that this engine has an average useful life of —— miles or —— hours of operation, whichever occurs first." The manufacturer may alter this statement only to express the useful life in terms other than miles or hours (e.g., years, or hours only);

(I) The subordinate addition to the statement in paragraph (a)(3)(iii)(H) of this section: "This engine's actual life may vary depending on its service application. (For additional information see the owner's maintenance instructions.) This engine conforms to U.S. EPA regulations applicable to 19— Model Year New Heavy-Duty Engines for its useful life."

(iv) The label may be made up of one or more pieces; *Provided*, That all pieces are permanently attached to the same engine or vehicle part as applicable.

(4)(i) *Gasoline-fueled heavy-duty vehicles.* A permanent, legible label shall be affixed in a readily visible position in the engine compartment. If such vehicles do not have an engine compartment, the label required in paragraphs (a)(4) and (g)(1) of this section shall be affixed in a readily visible position on the operator's enclosure or on the engine.

(ii) The label shall be affixed by the vehicle manufacturer who has been issued the certificate of conformity for such vehicle, in such a manner that it cannot be removed without destroying or defacing the label. The label shall not be affixed to any equipment which is easily detached from such vehicle.

(iii) The label shall contain the following information lettered in the English language in block letters and numerals which shall be of a color that contrasts with the background of the label:

(A) The label heading: Vehicle Emission Control Information;

(B) Full corporate name and trademark of manufacturer;

(C) Evaporative family identification;

(D) The maximum nominal fuel tank capacity (in gallons) for which the evaporative control system is certified.

(E) An unconditioned statement of compliance with the appropriate model year U.S. Environmental Protection Agency regulations which apply to gasoline-fueled heavy-duty vehicles.

(b) The provisions of this section shall not prevent a manufacturer from also reciting on the label that such vehicle (or engine) conforms to any applicable state emission standards for new motor vehicles (or new motor vehicle engines) or any other information that such manufacturer deems necessary for, or useful to, the proper operation and satisfactory maintenance of the vehicle (or engine).

(c)(1) The Manufacturer of any light-duty vehicle or light-duty truck subject to the emission standards of this subpart shall, in addition and subsequent to setting forth those statements on the label required by the Department of Transportation (DOT) pursuant to 49 CFR 567.4, set forth on the DOT label or on an additional label located in proximity to the DOT label and affixed as described in 40 CFR 567.4(b), the following information in the English language, lettered in block letters and numerals not less than three thirty-seconds of an inch high; of a color that contrasts with the background of the label:

(i) The Heading: "Vehicle Emission Control Information."

(ii)(A) *For light-duty vehicles*, the statement: "This Vehicle Conforms to U.S. EPA Regulations Applicable to 19— Model Year New Motor Vehicles."

(B) *For light-duty trucks*, the statement: "(Manufacturer's Corporate Name) Has Determined That This Vehicle Has An Average Useful Life of —— Miles Or —— Hours Of Operation, Whichever Occurs First. This Engine's Actual Life May Vary Depending On It's Service Application (For additional information see the owner's

maintenance instructions.) This Vehicle Conforms To U.S. EPA Regulations Applicable To 19—Model Year New Motor Vehicles, For Its Useful LIfe." The manufacturer may alter this statement only to express the useful life in terms other than miles or hours (e.g., years, or hours only).

(iii) One of the following statements, as applicable, in letters and numerals not less than six thirty-seconds of an inch high and of a color that contrasts with the background of the label:

(A) For all vehicles certified as non-catalyst-equipped: "NON-CATALYST"

(B) For all vehicles certified as catalyst-equipped which are included in a manufacturer's catalyst control program for which approval has been given by the Administrator: "CATALYST—APPROVED FOR IMPORT"

(C) For all vehicles certified as catalyst-equipped which are not included in a manufacturer's catalyst control program for which prior approval has been given by the Administrator: "CATALYST"

(2) In lieu of selecting either of the labeling options of paragraph (c)(1) of this section, the manufacturer may add the information required by paragraph (c)(1)(iii) of this section to the label required by paragraph (a) of this section. The required information will be set forth in the manner prescribed by paragraph (c)(1)(iii) of this section.

(d)(1) Incomplete light-duty trucks or incomplete heavy-duty vehicles optionally certified as light-duty trucks shall have the following prominent statement printed on the label required in paragraph (a)(2) of this section in lieu of the statement required by paragraph (a)(2)(iii)(E) of this section: "(Manufacturer's Corporate Name) has determined that this vehicle has an average useful life of —— miles or hours of operation, whichever occurs first." The manufacturer may alter this statement only to express the useful life in terms other than miles or hours (e.g., years, or hours only).

(2) The subordinate addition to the statement in subparagraph (1) of this paragraph: "This vehicle's actual life may vary depending on its service application. (For additional information see the owner's maintenance instructions.) This engine conforms to U.S. EPA regulations applicable to 19— Model Year New Heavy-Duty Engines when installed in a vehicle completed at a curb weight of more than 6,000 pounds or with a frontal area greater than 45 square feet for its useful life."

(e)(1) Incomplete heavy-duty vehicles having an 8,500-pound gross vehicle weight rating or less shall have the following prominent statement printed on the label required in paragraph (a)(3) of this section in lieu of the statement required by paragraph (a)(3)(iii)(H) of this section: ("Manufacturer's corporate name) has determined that this engine has an average useful life of —— miles or —— hours of operation, whichever occurs first." The manufacturer may alter this statement only to express the useful life in terms other than miles or hours (e.g., years, or hours only).

(2) In addition, the label shall have the following subordinate statement in lieu of the statement required by paragraph (a)(3)(iii)(I) of this section: "This engine's actual life may vary depending on its service application. (For additional information see the owner's maintenance instructions.) This engine conforms to U.S. EPA regulations applicable to 19— Model Year New Heavy-Duty Engines when installed in a vehicle completed at a curb weight of more than 6,000 pounds or with a frontal area greater than 45 square feet for its useful life."

(f) The manufacturer of any incomplete vehicle shall notify the purchaser of such vehicle of any curb weight, frontal area, or gross vehicle weight rating limitations affecting the emission certificate applicable to that vehicle. This notification shall be transmitted in a manner consistent with National Highway Traffic Safety Administration safety notification requirements published in 49 CFR Part 568.

(g)(1) Incomplete gasoline-fueled heavy-duty vehicles with a Gross Vehicle Weight Rating of greater than 8500 pounds shall have the following prominent statement printed on the label required in paragraph (a)(4) of this section: "(Manufacturer's corporate name) has determined that this vehicle conforms to U.S. EPA regulations applicable to 19— Model Year New Gasoline-Fueled Heavy-Duty Vehicles when completed with a nominal fuel tank capacity not to exceed — gallons. Persons wishing to add fuel tank capacity beyond the above maximum must submit a written statement to the Administrator that the hydrocarbon storage system has been upgraded according to the requirements of 40 CFR 86.085-35(g)(2)."

(2) Persons wishing to add fuel tank capacity beyond the maximum specified on the label required in paragraph (g)(1) of this section shall:

(i) Increase the amount of fuel tank vapor storage material according to the following function:

$$Cap_f = Cap_i \frac{T.\ Vol.}{Max.\ Vol.}$$

where:

Cap_f = final amount of fuel tank vapor storage material, grams.

Cap_i = initial amount of fuel tank vapor storage material, grams.

T. Vol. = total fuel volume of completed vehicle, gallons.

Max. Vol. = maximum fuel tank volume as specified on the label required in paragraph (g)(1) of this section, gallons.

(ii) Use, if applicable, hosing for fuel vapor routing which is at least as impermeable to hydrocarbon vapors as that used by the primary manufacturer.

(iii) Use vapor storage material with the same adsorptive characteristics as that used by the primary manufacturer.

(iv) Connect, if applicable, any new hydrocarbon storage device to the existing hydrocarbon storage device in series such that the original hydrocarbon storage device is situated between the fuel tank and the new hydrocarbon storage device. The original hydrocarbon storage device shall be sealed such that vapors cannot reach the atmosphere. The elevation of the original hydrocarbon storage device shall be equal to or lower than the new hydrocarbon storage device.

(v) Submit a written statement to the Administrator that paragraphs (g)(2)(i)–(iv) of this section have been complied with.

(3) If applicable, the Administrator will send a return letter verifying the receipt of the written statement required in paragraph (g)(2)(v) of this section.

14. A new § 86.085–37 is added to read as follows:

§ 86.085–37 Production vehicles and engines.

(a) Any manufacturer obtaining certification under this part shall supply to the Administrator, upon request, a reasonable number of production vehicles (or engines) selected by the Administrator which are representative of the engines, emission control systems, fuel systems, and transmission offered and typical of production models available for sale under the certificate. These vehicles (or engines) shall be supplied for testing at such time and place and for such reasonable periods as the Administrator may require. Heavy-duty engines supplied under this paragraph may be required to be mounted in chassis and appropriately equipped for operation on a chassis dynamometer.

(b)(1) Any manufacturer of light-duty vehicles or light-duty trucks obtaining certification under this part shall notify the Administrator, on a yearly basis, of the number of vehicles domestically produced for sale in the United States and the number of vehicles produced and imported for sale in the United States during the preceding year. A manufacturer may elect to provide this information every 60 days instead of yearly by combining it with the notification required under § 86.079–36. The notification must be submitted 30 days after the close of the reporting period. The vehicle production information required shall be submitted as follow:

(i) Total production volume expressed in terms of units produced;

(ii) Model type production volume, expressed for each model type in terms of units produced and as a percentage of total production;

(iii) Base level production volume, expressed for each base level in terms of units produced and as percentage of:

(A) Total production of its respective model type(s), and

(B) Total production; and

(iv) Vehicle configuration production volume, expressed for each vehicle configuration in terms of units produced, and as a percentage of the total production of its respective base level. In addition, each vehicle configuration shall be identified by its appropriate engine-system combination.

(2) All light-duty vehicles and light-duty trucks covered by a certificate of conformity under § 86.082–30(a) shall be adjusted by the manufacturer to the ignition or injection timing specification detailed in § 86.079–36(a)(1)(iii)(D).

(c) Any heavy-duty engine or gasoline-fueled heavy-duty vehicle manufacturer obtaining certification under this part shall notify the Administrator, on a yearly basis, of the number of engines or vehicles of such engine family-evaporative emission family-engine displacement-exhaust emission control system-fuel system combination produced for sale in the United States during the preceding year.

(d) The following definitions apply to this section:

(1) "Model type" means a unique combination of car line, basic engine, and transmission class.

(2) "Base level" means a unique combination of basic engine, inertia weight, and transmission class.

(3) "Vehicle configuration" means a unique combination of basic engine, engine code, inertia weight, transmission configuration, and axle ratio within a base level.

Part 86 of Chapter I, Title 40 of the Code of Federal Regulations is amended by adding a new Subpart M to read as follows:

Subpart M—Evaporative Emission Test Procedures for New Gasoline-Fueled Heavy-Duty Vehicles

Sec.

Authority: Sections 202, 206, 301 of the Clean Air Act as amended, 42 U.S.C. 7521, 7525, 7601.

Subpart M—Evaporative Emission Test Procedure for New Gasoline-Fueled Heavy-Duty Vehicles

§ 86.1201–85 Applicability.

(a) The provisions of this subpart are applicable to new gasoline-fueled heavy-duty vehicles.

(b) Provisions of this subpart apply to tests performed by both the Administrator and motor vehicle manufacturers.

(c) Test procedures and equipment other than those described in this subpart may be used by the vehicle manufacturer if shown to yield results which correlate with results yielded by those described in this subpart (with the reference driving schedule described in § 86.1215–85(a)) and if approved in advance by the Administrator.

§ 86.1202–85 Definitions

Applicable definitions in sections (§§)86.077–2, 86.078–2, 86.079–2, 86.080–2, 86.081–2, 86.082–2 and 86.085–2 apply to this subpart.

§ 86.1203–85 Abbreviations.

The abbreviations in § 86.079–3 apply to this subpart.

§ 86.1204 [Reserved]

§ 86.1205–85 Introduction; structure of subpart.

(a) This subpart describes the equipment required and the procedures to follow in order to determine evaporative emission levels from gasoline-fueled heavy-duty vehicles.

(b) Three topics are addressed in this subpart. §§ 86.1206–85 through 86.1215–85 set forth specifications and equipment requirements; §§ 86.1216–85 through 86.1226–85 discuss calibration methods and frequency; test procedures and data requirements are listed (in approximate order of performance) in §§ 86.1227–85 through 86.1245–85.

§ 86.1206–85 Equipment required; overview.

This subpart specifies procedures for testing of gasoline-fueled heavy-duty vehicles. Equipment required and specifications are as follows:

(a) *Evaporative emissions tests.* § 86.1207–85 specifies the necessary equipment.

(b) *Fuel, analytical gas, and driving schedule specifications.* Fuel specifications for emission testing and for service accumulation are specified in § 86.1213–85. Analytical gases are specified in § 86.1214–85. Both vehicle preconditioning for the diurnal loss test and vehicle operation prior to the hot soak loss test include operation on a chassis dynamometer. The driving cycle (EPA heavy-duty vehicle urban dynamometer driving schedule) is specified in § 86.1215–85.

§ 86.1207–85 Sampling and analytical system; evaporative emissions.

The following is a description of the components which will be used in evaporative emissions sampling systems for testing under this subpart.

(a) *Evaporative emission measurement enclosure.* The enclosure shall be readily sealable, rectangular in shape, with space for personnel access to all sides of the vehicle. When sealed, the enclosure shall be gas tight in accordance with § 86.1217–81. Interior surfaces must be impermeable to hydrocarbons. At least one surface shall be constructed of flexible, impermeable material to allow for minor volume changes which result from temperature changes. No interior surface temperatures shall be less than 68°F (20°C).

(b) *Evaporative emission hydrocarbon analyzer.* A hydrocarbon analyzer utilizing the hydrogen flame ionization principle (FID) shall be used to monitor the atmosphere within the enclosure. Instrument bypass flow may be returned to the enclosure. The FID shall have a response time to 90 percent of final reading of less than 1.5 seconds, and be capable of meeting performance requirements expressed as a function of C_{std}, where C_{std} is the specific enclosure hydrocarbon level, in ppm, corresponding to the evaporative emission standard.

(1) Stability of the analyzer shall be better than 0.01 C_{std} ppm at zero and span over a 15-minute period on all ranges used.

(2) Repeatability of the analyzer, expressed as one standard deviation, shall be better than 0.005 C_{std} ppm on all ranges used.

(c) *Evaporative emission hydrocarbon date recording system.* The electrical output of the FID shall be recorded at least at the initiation and termination of each diurnal and hot soak. The recording may be by means of a strip chart potentiometric recorder, by use of an online computer system, or by other suitable means. In any case, the recording system must have operational characteristics (signal to noise ratio, speed of response, etc.) equivalent to or better than those of the signal source being recorded, and must provide a permanent record of results. The record shall show a positive indication of the initiation and completion of each soak.

(d) *Tank fuel heating system.* The tank fuel heating system shall consist of a heat source and a temperature controller. A typical heat source is a 2000 W heating pad. Other sources may be used as required by circumstances. The temperature controller may be manual, such as a variable voltage transformer, or may be automated. The heating system must not cause hot spots on the tank wetted surface which could cause local overheating of the fuel. Heat must not be applied to the vapor in the tank above the liquid fuel. The temperature controller must be capable of controlling the fuel tank temperature during the diurnal soak to within ±3°F (1.7°C) of the following equation:

$$F = T_o + 0.4t$$

or for SI units:

$$C = T_o + (2/9)t$$

Where:
F = Temperature in °F
C = Temperature in °C
t = Time since start of test in minutes
T_o = Initial temperature in °F (or in °C for SI units)

(e) *Temperature recording system.* Strip chart recorder(s) or an automatic data processor shall be used to record enclosure ambient and vehicle fuel tank temperature at least once every minute. The temperature recorder or data processor shall have a time accuracy of ± 15s, a time precision of ± 15s and be capable of resolving temperature to ± 0.75°F (0.42°C). The temperature recording system (recorder and sensor) shall have an accuracy of ± 3°F (1.7°C). Two ambient temperature sensors, connected to provide one average output, shall be located in the enclosure. These sensors shall be located at the approximate vertical centerline of each side wall extending 4 inches (nominally) into the enclosure at a height of 3 ± 0.5 ft (0.9 + 0.2 m). The vehicle fuel tank temperature sensor shall be located in the fuel tank so as to measure the temperature of the prescribed test fuel at the approximate mid-volume of the fuel. Manufacturers shall arrange that vehicles furnished for testing at Federal certification facilities be equipped with iron-constantan Type J thermocouples for measurement of fuel tank temperature.

(f) *Purge blower.* One or more portable or fixed blowers shall be used to purge the enclosure. The blowers shall have sufficient flow capacity to reduce the inclosure hydrocarbon concentration from the test level to the ambient level between tests. Actual flow capacity will depend upon the time available between tests.

(g) *Mixing blower.* One or more blowers or fans with a total capacity of 250 to 750 cfm per 1000 ft^3 of enclosure volume shall be used to mix the contents of the enclosure during evaporative emission testing. The mixing blower(s) shall be arranged such that a uniform concentration is maintained. No portion of the air stream shall be directed towards the vehicle.

§ 86.1208 [Reserved]

§ 86.1209 [Reserved]

§ 86.1210 [Reserved]

§ 86.1211 [Reserved]

§ 86.1212 [Reserved]

§ 86.1213–85 Fuel specifications.

(a) Gasoline having the following specifications will be used in emissions testing.

Item	ASTM	Leaded	Unleaded
Octane; research, minimum	D2699	98	93
Sensitivity, minimum		7.5	7.5
Lead (organic), grams/U.S. gallon		[1]1.4	0.00–0.05
Distillation range:			
IBP, °F	D86	75–95	75–95
10 pct point, °F	D86	120–135	120–135
50 pct point, °F	D86	200–230	200–230
90 pct point, °F	D86	300–325	300–325
EP, °F (maximum)	D86	415	415
Sulphur, weight percent, maximum	D1266	0.10	0.10
Phosphorous, grams/U.S. gallon, maximum		0.01	0.005
RVP, pounds per square inch	D323	8.7–9.2	8.7–9.2
Hydrodcarbon composition:			
Olefins, percent maximum	D1319	10	10
Aromatics, percent maximum	D1319	35	35
Saturates	D1319	[2]	[2]

[1] Minimum.
[2] Remainder.

(b) Gasoline representative of commercial gasoline which will be generally available through retail outlets shall be used in service accumulation. For leaded gasoline the minimum lead content shall be 1.4 grams per U.S. gallon, except that where the Administrator determines that vehicles represented by a test vehicle will be operated using gasoline of different lead content than that prescribed in this paragraph, he may consent in writing to use a gasoline with a different lead content. The octane rating of the gasoline used shall be no higher than 1.0 research octane number above the minimum recommended by the manufacturer and have a minimum sensitivity of 7.5 octane numbers, where sensitivity is defined as the research octane number minus the motor octane number. The Reid vapor pressure of the gasoline used shall be characteristic of the motor fuel used during the season in which the service accumulation takes place.

(c) The specification range of the gasoline to be used under paragraph (b) of this section shall be recorded.

§ 86.1214–85 Analytical gases.

(a) Analyzer gases.

(1) Gases for the hydrocarbon analyzer shall be single blends of propane using air as the diluent.

(2) Fuel for the evaporative emission enclosure FID shall be a blend of 40±2% hydrogen with the balance being helium. The mixture shall contain less than 1 ppm equivalent carbon response. 98 to 100 percent hydrogen fuel may be used with advance approval by the Administrator.

(3) The allowable zero air impurity concentration shall not exceed 1 ppm equivalent carbon response.

(4) "Zero grade air" includes artificial "air" consisting of a blend of nitrogen and oxygen with oxygen concentrations between 18 and 21 mole percent.

(5) The use of proportioning and precision blending devices to obtain the required analyzer gas concentrations is allowable provided their use has been approved in advance by the Administrator.

(b) Calibration gases shall be traceable to within ±1 percent of NBS gas standards.

(c) Span gases shall be accurate to within ±2 percent of true concentration, where true concentration refers to NBS gas standards.

§ 86.1215–85 EPA heavy-duty vehicle (HDV) urban dynamometer driving schedule.

(a) The EPA dynamometer driving schedule for heavy-duty vehicles is a 1060 second transient speed versus time cycle which is designed to simulate gasoline-fueled HDV operation in urban areas. A second by second listing of this schedule is given in Appendix I(d) of this part. Thirty-three percent of the cycle is idle operation, and the average vehicle speed is 18.9 mph (30.4 km/hr).

(b) The speed tolerance at any given time on the transient speed vs. time driving schedule is defined by upper and lower limits. The upper limit is 4 mph (6.4 km/hr) higher than the highest point on the trace within 1 second of the given time. The lower limit is 4 mph (6.4 km/hr) lower than the lowest point on the trace within 1 second of the given time. Speed variations greater than the tolerances (such as may occur during gear changes) are acceptable provided they occur for less than 2 seconds on any occasion. Speeds lower than those prescribed are acceptable provided the vehicle is operated at maximum available power during such occurrences.

(c) The Administrator will use this driving schedule when conducting evaporative emission tests.

§ 86.1216–85 Calibrations; frequency and overview.

(a) Calibrations shall be performed as specified in §§ 86.1217–85 through 86.1226–85.

(b) At least yearly or after any maintenance which could alter background emission levels, enclosure background emission measurements shall be performed.

(c) At least monthly or after any maintenance which could alter calibration, the following calibrations and checks shall be performed:

(1) Calibrate the hydrocarbon analyzer (see § 86.1221–85).

(2) Calibrate the dynamometer. If the dynamometer receives a weekly performance check (and remains within calibration) the monthly calibration need not be performed (see § 86.1218–85).

(3) Perform a hydrocarbon retention check and calibration on the evaporative emission enclosure (see § 86.1217–85).

§ 86.1217–85 Evaporative emission enclosure calibrations.

The calibration of the evaporative emission enclosure consists of three parts: Initial and periodic determination of enclosure background emissions; initial determination of enclosure internal volume; and periodic hydrocarbon retention check and calibration.

(a) *Initial and periodic determination of enclosure background emissions.* Prior to its introduction into service, annually thereafter, and after any repair which can affect the enclosure background emissions, the enclosure shall be checked to determine that it does not contain materials which will themselves emit hydrocarbons. Proceed as follows:

(1) Zero and span (calibrate if required) the hydrocarbon analyzer.

(2) Purge the enclosure until a stable background hydrocarbon reading is obtained.

(3) Turn on the mixing blower (if not already on).

(4) Seal enclosure and measure background hydrocarbon concentration, enclosure temperature, and barometric pressure. These are the initial readings C_{HCi}, T_i, and P_{Bi} for the enclosure background determination.

(5) Allow the enclosure to stand undisturbed without sampling for four hours.

(6) Measure the hydrocarbon concentration on the same FID. This is the final concentration, C_{HCf}. Also measure final temperature and barometric pressure.

(7) Calculate the mass change of hydrocarbons in the enclosure according to the equations in paragraph (d) of this section. The enclosure background emissions shall not be greater than 0.4g for the 4 hours.

(b) *Initial determination of enclosure internal volume.* Prior to its introduction into service the enclosure internal volume shall be determined by the following procedure.

(1) Carefully measure the internal length, width and height of the enclosure, accounting for irregularities (such as braces, cooling system components, etc.) and calculate the internal volume.

(2) Perform an enclosure calibration check according to paragraphs (c) (1) through (7) of this section.

(3) If the calculated mass does not agree within ±2 percent of the injected propane mass, then corrective action is required.

(c) *Hydrocarbon retention check and calibration.* The hydrocarbon retention check provides a check upon the calculated volume and also measures the leak rate. Prior to its introduction into service and at least monthly thereafter the enclosure leak rate shall be determined as follows:

(1) Zero and span (calibrate if required) the hydrocarbon analyzer.

(2) Purge the enclosure until a stable background hydrocarbon reading is obtained.

(3) Turn on the mixing blower(s) (if not already on).

(4) Seal enclosure and measure background hydrocarbon concentration, temperature and barometric pressure. These are the initial readings (c_{HCi}, T_i and P_{Bi} for the enclosure calibration.

(5) Inject into the enclosure a known quantity of pure propane. (4g is a convenient quantity.) The propane may be measured by volume flow or by mass measurement. The method used to measure the propane shall have an accuracy and precision of ±0.5 percent of the measured value.

(6) After a minimum of 5 minutes of mixing, analyze the enclosure atmosphere for hydrocarbon content; also record temperature and pressure. These measurements are the final readings for the enclosure calibration as well as the initial readings for the retention check.

(7) To verify the enclosure calibration calculate the mass of propane using the measurements taken in steps (4) and (6) using the equations in paragraph (d) of this section. This quantity must be within ±2 percent of that measured in step (5) above.

(8) Allow the enclosure to remain sealed for a minimum of 4 hours without sampling and with the mixing blower(s) operating. After 4 hours analyze the enclosure atmosphere for hydrocarbon content; record temperature and barometric pressure. These are the final readings for the hydrocarbon retention check.

(9) Calculate the hydrocarbon mass using the equations in paragraph (d) of this section and the readings taken in (8). It may not differ by more than ±4 percent of the value in step (6).

(d) *Calculations.* The calculation of net hydrocarbon mass change is used to determine enclosure background and leak rate. It is also used to check the enclosure volume measurements. The mass change is calculated from the initial and final readings of hydrocarbon concentration, temperature and pressure according to the following equation:

$$M_{HC} = kV \times 10^{-4} \left[\frac{C_{HCf} P_{Bf}}{T_f} - \frac{C_{HCi} P_{Bi}}{T_i} \right]$$

Where:

M_{HC} = Hydrocarbon mass change, g.
C_{HC} = Hydrocarbon concentration as ppm carbon.
V = Enclosure volume, ft^3 (m^3), as measured in paragraph (b)(1) of this section.
P_B = Barometric pressure, in. Hg (kPa).
T = Enclosure ambient temperature, R(K).
k = 3.05, for SI units k = 17.68.
i = Indicated initial reading.
f = Indicates final reading.

Note.—Hydrocarbon concentration is stated in ppm carbon, that is, ppm propane x 3. Expressions in parentheses are for SI units.

§ 86.1218-85 Dynamometer calibration.

(a) The dynamometer shall be calibrated at least once each month or performance verified at least once each week and then calibrated as required. The calibration shall consist of the manufacturer's recommended calibration procedure plus a determination of the dynamometer frictional power absorption. If the dynamometer is to be used for driving only the reference (transient) schedule, the frictional power absorption needs to be determined only at 50.0 mph (80.5 km/hr). If the dynamometer is to be used for driving the steady-state cycle, the frictional power absorption needs to be determined through the range of 15 to 50 mph. One method for determining dynamometer frictional power absorption at 50.0 mph (80.5 km/hr) is described below. The same general method can be used at other speeds. Other methods may be used if shown to yield equivalent results. The measured absorbed road power includes the dynamometer friction as well as the power absorbed by the power absorption unit. The dynamometer is driven above the test speed range. The device used to drive the dynamometer is then disengaged from the dynamometer and the roll(s) is (are) allowed to coastdown. The kinetic energy of the system is dissipated by the dynamometer. This method neglects the variations in roll bearing friction due to the drive axle weight of the vehicle. In the case of dynamometers with paired rolls, the inertia and power absorption of the free (rear) roll may be neglected if its inertia is less than 3.0 percent of the total equivalent inertia required for vehicle testing.

(1) Devise a method to determine the speed of the roll(s) to be measured for power absorption. A fifth wheel, revolution pickup, or other suitable means may be used.

(2) Place a vehicle on the dynamometer or devise another method of driving the dynamometer.

(3) If the dynamometer is capable of simulating more than a single inertia mass, engage the inertial flywheel or other inertial simulation system for the most common vehicle mass category for which the dynamometer is used. In addition, other vehicle mass categories may be calibrated, if desired.

(4) Drive the dynamometer up to 50 mph (80.5 km/hr).

(5) Record indicated road power.

(6) Drive the dynamometer up to 60 mph (96.9 km/hr).

(7) Disengage the device used to drive the dynamometer.

(8) Record the time for the dynamometer roll(s) to coastdown from 55.0 mph (88.5 km/hr) to 45.0 mph (72.4 km/hr).

(9) Adjust the power absorption unit to a different level.

(10) Repeat steps (4) to (8) above sufficient times to cover the range of road power used.

(11) Calculate absorbed road power (HP_d). (See paragraph (c) of this section.)

(12) Plot indicated road load power at 50 mph (80.5 km/hr) versus road load power at 50 mph (80.5 km/hr).

(b) The performance check consists of conducting a dynamometer coastdown and comparing the coastdown time to that recorded during the last calibration. If the coastdown times differ by more than 1 second or by 5 percent of the time recorded during the last calibration, whichever is greater, a new calibration is required.

(c) Calculations. The road load power actually absorbed by each roll assembly (or roll-inertia weight assembly) of the dynamometer is calculated from the following equation:

$$HP_d = (\tfrac{1}{2})\,(W/32.2)\,(V_1^2 - V_2^2)/550t$$

Where:

HP_d = Power, horsepower (kilowatts)
W = Equivalent inertia, lb (kg)
V_1 = Initial velocity, ft/s (m/s) (55 mph = 88.5 km/h = 80.67 ft/s = 24.58 m/s)
V_2 = Final velocity, ft/s (m/s) (45 mph = 72.4 km/h = 66 ft/s = 20.11 m/s)
t = Elapsed time for rolls to coast from 55 mph to 45 mph (88.5 to 72.4 km/hr).

(Expressions in parenthesis are for SI units). When the coastdown is from 55 to 45 mph (88.5 to 72.4 km/hr) the above equation reduces to:

$HP_d = 0.06073\,(W/t)$

For SI units:

$HP_d = 0.09984\,(W/t)$

The total road load power actually absorbed by the dynamometer is the sum of the absorbed road load power of each roll assembly.

§ 86.1210 [Reserved]

§ 86.1220 [Reserved]

§ 86.1221-85 Hydrocarbon analyzer calibration.

The FID hydrocarbon analyzer shall receive the following initial and periodic calibration.

(a) Initial and periodic optimization of detector response. Prior to its introduction into service and at least annually thereafter the FID hydrocarbon analyzer shall be adjusted for optimum hydrocarbon response. Alternate methods yielding equivalent results to the procedure listed below may be used.

(1) Follow the manufacturer's instructions for instrument startup and basic operating adjustment using the appropriate fuel and zero-grade air.

(2) Optimize on the most common operating range. Introduce into the analyzer, a propane in air mixture with a propane concentration equal to approximately 90 percent of the most common operating range.

(3) Select an operating fuel flow rate that will give near maximum response and least variation in response with minor fuel flow variations.4

(4) To determine the optimum air flow, use the fuel flow setting determined above and vary air flow.

(5) After the optimum flow rates have been determined, they are recorded for future reference.

(b) Initial and periodic calibration. Prior to its introduction into service and monthly thereafter the FID hydrocarbon analyzer shall be calibrated on all normally used instrument ranges. Use the same flow rate as when analyzing samples.

(1) Adjust analyzer to optimize performance.

(2) Zero the hydrocarbon analyzer with zero-grade air.

(3) Calibrate on each normally used operating range with propane-in-air calibration gases having nominal concentrations of 15, 30, 45, 60, 75, and 90 percent of that range. For each range calibrated, if the deviation from a least-squares best-fit straight line is 2 percent or less of the value at each data point, concentration values may be calculated by use of a single calibration factor for that range. If the deviation exceeds 2 percent at any point, the best-fit non-linear equation which represents the data to within 2 percent of each test point shall be used to determine concentration.

§ 86.1222 [Reserved]

§ 86.1223 [Reserved]

§ 86.1224 [Reserved]

§ 86.1225 [Reserved]

§ 86.1226-85 Calibration of other equipment.

Other test equipment used for testing shall be calibrated as often as required by the manufacturer or as necessary according to good practice.

§ 86.1227-85 Test procedures; overview.

(a) The overall test consists of prescribed sequences of fueling, parking, and operating conditions. Vehicles are tested only for evaporative emissions.

(b) The evaporative emission test (gasoline-fueled vehicles only) is designed to determine hydrocarbon evaporative emissions as a consequence of diurnal temperature fluctuation, urban driving and hot soaks during engine-off periods. It is associated with a series of events representative of heavy-duty vehicle operation, which result in hydrocarbon vapor losses. The test procedure is designed to measure:

(1) Diurnal breathing losses resulting from daily temperature changes, measured by the enclosure technique;

(2) Running losses from suspected sources (if indicated by engineering analysis or vehicle inspection) resulting from a simulated trip on a chassis dynamometer, measured by carbon traps; and

(3) Hot soak losses which result when the vehicle is parked and the hot engine is turned off, measured by the enclosure technique.

§ 86.1228-85 Transmissions.

(a) All test conditions, except as noted, shall be run in a manner representative of in-use operation, and where appropriate, according to the manufacturer's recommendation to the ultimate purchaser.

(b) Except for the first idle mode, idle modes less than one minute in length shall be run with automatic transmissions in "Drive" and the wheels braked; manual transmissions shall be in gear with the clutch disengaged, except first idle. The first idle mode and idle modes longer than one minute in length shall be run with automatic transmissions in "Neutral," and manual transmissions shall be in "Neutral" with the clutch engaged (clutch may be disengaged for engine start-up).

(c) The vehicle shall be driven with minimum accelerator pedal movement to maintain the desired operation.

(d) Accelerations shall be driven smoothly according to the manufacturer's recommendation to the ultimate purchaser. For manual transmissions, the operator shall accomplish each shift with minimum time. If the vehicle cannot accelerate at the specified rate, the vehicle shall be operated at maximum available power until the vehicle speed reaches the value prescribed for that time in the driving schedule.

(e) For those deceleration modes which decelerate to zero, manual transmission clutches shall be depressed when the speed drops below 15 mph (24.1 km/hr), when engine roughness is evident, or when engine stalling is imminent.

§ 86.1229-85 Dynamometer load determination.

(a) Flywheels, electrical or other means of simulating inertia shall be used. The value of equivalent inertia weight shall be within 250 pounds of the loaded vehicle weight (LVW). Loaded vehicle weight is defined as follows:

(1) For test vehicles which have an actual weight less than 0.5×(GVWR),

LVW=0.5×(Gross Vehicle Weight Rating)

(2) For test vehicles which have an actual weight (As tested) greater than 0.5×(GVWR),

LVW=Actual Weight of Test Vehicle.

(b) *Power absorption unit adjustment.* (1) The power absorption unit shall be adjusted to reproduce road load power at 50 mph true speed. The indicated road load power setting shall take into account the dynamometer friction. The relationship between road load (absorbed) power and indicated road load power for a particular dynamometer shall be determined by the procedure outlined in § 86.1218-85 or other suitable means.

(2) The road load power used shall be determined from the following equation:

$$RLP = 0.67\,(H - 0.75)W + 0.00125\,[LVW - (N \times DW)]$$

where

RLP=Road Load Power at 50 mph (horsepower).

H=Vehicle overall maximum height (feet).

LVW=Loaded vehicle weight (pounds).

DW=Vehicle weight supported by the dynamometer (pounds).

N=Number of dynamometer rolls supporting a tire.

or, for vehicles which the manufacturer could have certified by the light-duty trucks (LDT) test procedure as allowed in the optional certification provision (§ 86.074-1(b)), the manufacturer may determine the road load power by an alternate procedure (including coastdown) if approved in advance by the Administrator. For vehicles which the manufacturer does choose to certify by the light-duty truck test procedure, the evaporative emission test procedure (and standard) will be that specified by the light-duty truck regulations.

§ 86.1230-85 Test sequence; general requirements.

The test sequence shown in Figure M82-1 shows the steps encountered as the test vehicle undergoes the test procedure. Ambient temperature levels encountered by the test vehicle throughout the test sequence shall not be less than 68°F (20°C) nor more than 86°F (30°C). The vehicle shall be approximately level during all phases of the test sequence to prevent abnormal fuel distribution.

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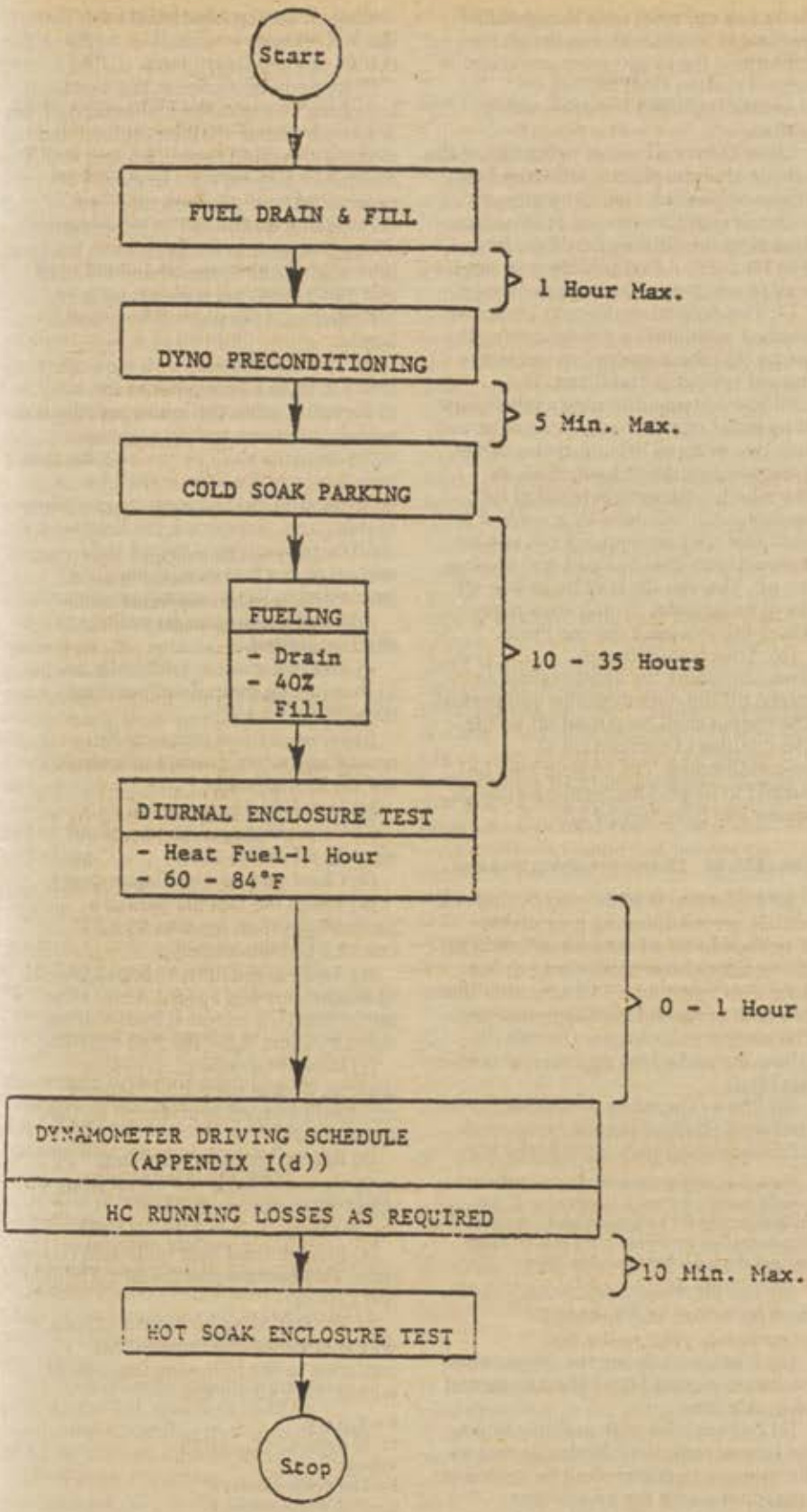

Figure M85-1 - Test Sequence

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§ 86.1231–85 Vehicle preparation.

(a) Prepare the fuel tank(s) for recording the temperature of the prescribed test fuel at the approximate mid-volume of the fuel when the tank is 40% full.

(b) Provide additional fittings and adapters, as required, to accommodate a fuel drain at the lowest point possible in the tank(s) as installed on the vehicle.

(c)(1) Any vapor storage device which adsorbs HC vapors and subsequently releases them to the engine induction system during vehicle operation shall be subjected to a minimum of 30 load-purge cycles or the equivalent thereof (4,000 miles or more of actual in-use vehicle service accumulation shall be considered equivalent). One load-purge cycle shall be accomplished by conducting one of the following procedures:

(i) *Vehicle Procedure.* Park a fully-warm vehicle (a vehicle that has been driven for at least 15 minutes) for a time period of at least 3 hours. Fill the fuel tank(s) to the prescribed "tank fuel volume" with specified test fuel (§ 86.1213–85) at room temperature. Then drive the vehicle through at least one cycle of the HDV reference (transient) urban dynamometer driving schedule.

(ii) *Laboratory Procedure.* Flow gasoline vapors into a pre-purged vapor storage device until at least 10 percent of the input HC mass flow rate is passing through the device. Purge the device with a volume of air which is at least as great as, and which has a temperature no higher than that which would be drawn through the device if it were installed on the test vehicle and the vehicle was operated according to the HDV reference (transient) urban dynamometer driving schedule. The vapor flow rate, the method used to generate the vapors, the air flow rate, and the air temperature shall be recorded. If pre-blended gas is used, then the composition and characteristics of the gas shall be recorded.

(2) Ten load-purge cycles accumulated immediately prior to testing shall be conducted according to the method in paragraph (c)(1)(i) of this section. The preceding 20 cycles (minimum) shall be conducted according to either of the methods in paragraph (c)(1)(i) or (ii) of this section.

§ 86.1232–85 Vehicle preconditioning.

(a) The vehicle shall be moved to the test area and the following operations performed:

(1) The fuel tank(s) shall be drained through the provided fuel tank(s) drain(s) and filled to the prescribed "tank fuel volume" with the specified test fuel, § 86.1213–85. For the above operations the evaporative emission control system shall neither be abnormally purged nor abnormally loaded.

(2) Within one hour of being fueled the vehicle shall be placed, either by being driven or pushed, on a dynamometer and operated through one HDV urban dynamometer driving schedule, (see § 86.1251–85). A test vehicle may not be used to set dynomometer horsepower.

(3) The Administrator may choose to conduct additional preconditioning to insure that the evaporative emissions control system is stabilized. The additional preconditioning shall consist of an intial one hour minimum soak and one, two or three driving cycles of the dynamometer driving schedule, as described in paragraph (a)(2) of this section, each followed by a soak of at least one hour with engine off, engine compartment cover closed and cooling fan off. The vehicle may be driven off the dynamometer for the soak period which follows each driving cycle.

(b) After completion of preconditioning the vehicle shall be driven off the dynamometer and parked. The engine shall be turned off within five minutes of completion of preconditioning. The vehicle may be pushed to its parking location after its engine has been turned off.

§ 86.1233–85 Diurnal breathing loss test.

(a) Following vehicle preparation and vehicle preconditioning procedures described in §§ 86.1231–85 and 86.1232–85 the diurnal test shall start not less than 10 or more than 35 hours after the end of the preconditioning procedure. The start of vehicle operation shall follow the end of the diurnal test within one hour.

(b) The evaporative emissions enclosure shall be purged for several minutes immediately prior to the test.

Note.—If at any time the hydrocarbon concentration exceeds 15,000 ppm C the enclosure should be immediately purged. This concentration provides a 4:1 safety factor against the lean flammability limit.

(c) The FID hydrocarbon analyzer shall be zeroed and spanned immediately prior to the test.

(d) If not already on, the evaporative enclosure mixing fan(s) shall be turned on at this time.

(e) For vehicles with multiple tanks, the largest tank shall be designated as the primary tank and shall be heated in accordance with the procedures described in paragraph (l) of this section. All other tanks shall be designated as auxiliary tanks and shall undergo a similar heat build such that the fuel temperature shall be within 3°F (1.6°C) of the primary tank.

(f) Immediately prior to the diurnal breathing loss test, the fuel tank(s) of the prepared vehicle shall be drained and recharged with the specified test fuel, as defined in § 86.1213–85, to the prescribed "tank fuel volume", as defined in § 86.078–2. The temperature of the fuel prior to its delivery to the fuel tank shall be between 50 and 60°F (10 and 16°C). The fuel tank cap(s) is not installed until the diurnal heat build begins.

(g) The test vehicle, with the engine shut off, shall be moved into the evaporative emission enclosure, the test vehicle windows and any storage compartments shall be opened, the fuel tank temperature sensor shall be connected to the temperature recording system, and, if required, the heat source shall be properly positioned with respect to the fuel tank(s) and/or connected to the temperature controller.

(h) The temperature recording system shall be started.

(i) The fuel may be artificially heated to the starting diurnal temperature, 60±2°F (16±1.1°C).

(j) When the fuel temperature recording system reaches at least 58°F (14°C), immediately:

(1) Install fuel tank cap(s).

(2) Turn off purge blowers, if not already off at this time.

(3) Close and seal enclosure doors.

(k) When the fuel temperature recording system reaches 60±2°F (16±1.1°C) immediately:

(1) Analyze enclosure atmosphere for hydrocarbons and record. This is the initial (time=0 minutes) hydrocarbon concentration, C_{HCi} (see § 86.1243–85).

(2) Record barometric pressure reading. This is the initial (time=0 minutes) barometric pressure, P_{bi} (see § 86.1243–85).

(3) Record enclosure ambient temperature. This is the initial (time=0 minutes) enclosure ambient temperature, T_i (see § 86.1243–85).

(4) Start diurnal heat build and record time. This commences the 60±2 minute test period.

(l) The fuel shall be heated in such a way that its temperature change conforms to the following function to within ±3°F (±1.6°C):

$F = T_o + 0.4t$

for SI units, $C = T_o + (2/9)t$

Where:

F = fuel temperature, F°

C = fuel temperature, F°

t = fuel temperature, F°

T_o = initial temperature in °F (or in °C for SI units).

After 60±2 minutes of heating, the fuel temperature rise shall be 24±°F (13.3±0.5°C).

(m) The FID hydrocarbon analyzer shall be zeroed and spanned immediately prior to the end of the diurnal test.

(n)(1) The end of the diurnal breathing loss test occurs 60±2 minutes after the heat build begins (paragraph (k)(4)). Analyze the enclosure atmosphere for hydrocarbon and record. This is the final (time=60 minutes) hydrocarbon concentration, C_{HCf} (see § 86.1234–85). The time (or elapsed time) of this analysis shall be recorded.

(2) Record barometric pressure reading. This is the final (time=60 minutes) barometric pressure, P_{bf} (see § 86.1234–85).

(3) Record enclosure ambient temperature. This is the final (time=60 minutes) enclosure ambient temperature, T_f (see § 86.1234–85).

(o) The heat source shall be turned off and the enclosure doors unsealed.

(p) The heat source shall be moved away from the vehicle, if required, and/or disconnected from the temperature controller, the fuel tank temperature sensor shall be disconnected from the temperature recording system, and the test vehicle windows and any storage compartments may be closed. The vehicle shall be either driven or pushed out of the evaporative emission enclosure.

§ 86.1234–85 Running loss test.

If an engineering analysis or vehicle inspection indicates the possibility of evaporative emissions during vehicle operation, evaporative emission running loss measurements shall be made during vehicle operation on the dynamometer in preparation for the hot soak test. Since running loss measurements cannot be made in the enclosure, the equipment described in Subpart B, § 86.177–17 for running loss measurements shall be used to collect these emissions.

(a) The procedure in § 86.1235–85 shall be followed.

(b) Prior to the initiation of the dynamometer hot soak preparation run, the vapor loss measurement system shall be connected to all suspected sources of running loss evaporative emissions.

(c) Operation on the dynamometer prior to the hot soak test shall be conducted according to the procedures of §§ 86.1235–85 through 86.1237–85.

(d) Within one minute after the end of the hot soak preparation run, the vapor loss measurement system shall be disconnected from the vehicle and the inlets and outlets sealed.

(e) Within one hour from the end of the running loss measurement, the vapor collection traps shall be weighed.

§86.1235–85 Dynamometer procedure.

(a) The dynamometer run consists of one HDV urban dynamometer driving schedule cycle starting within one hour after completion of the diurnal loss test. This run includes engine startup (with all accessories turned off) and operation over the driving schedule.

(b) During dynamometer operation, one or more cooling fans shall be positioned so as to direct cooling air to the vehicle in an appropriate manner. The engine compartment cover shall be closed. If, however, the manufacturer can show that the engine compartment cover must be open to provide a test representative of field operation, the Administrator will allow the engine cover to be open. In the case of vehicles with front engine compartments, the fan(s) shall be squarely positioned within 12 inches of the vehicle. In the case of vehicles with rear engine compartments (or if special designs make the above impractical), the cooling fan(s) shall be placed in a position to provide sufficient air to maintain vehicle cooling. The fan capacity shall normally not exceed 10,600 (cfm (5.0 m^3/s)). If, however, the manufacturer can show that during field operation the vehicle receives additional cooling, and that such additional cooling is needed to provide a representative test, the fan capacity may be increased or additional fans used.

(c) The vehicle speed as measured from the dynamometer rolls shall be used.

(d) Practice runs over the prescribed driving schedule may be performed at test points, provided emissions are not measured, for the purpose of finding the minimum throttle action to maintain the proper speed-time relationship, or to permit test procedure adjustments.

Note.—When using two-roll dynamometers a truer speed-time trace may be obtained by minimizing the rocking of the vehicle in the rolls. The rocking of the vehicle changes the tire rolling radius on each roll. This rocking may be minimized by restraining the vehicle horizontally (or nearly so) by using a cable and winch, or chain.

(e) Drive wheel tires shall be inflated to the maximum gauge pressure recommended to the ultimate purchaser. If drive wheel tires have a maximum recommended inflation gauge pressure of less than 45 psi (310 kPa), they may be inflated up to a gauge pressure of 45 psi (310 kPa) in order to prevent tire damage. The drive wheel tire pressure shall be recorded with the test results.

(f) If the dynamometer has not been operated during the 2-hour period immediately preceding the test it shall be warmed up for 15 minutes by operating at 30 mph (48 km/h) using a non-test vehicle or as recommended by the dynamometer manufacturer.

(g) If the dynamometer horsepower must be adjusted manually, the power shall be set within 1 hour prior to dynamometer operation preceding the hot soak test. The test vehicle shall not be used to make the adjustment.

(h) If the dynamometer horsepower is selected by automatic control, the power may be set anytime prior to the beginning of the driving cycle.

(i) Multiple drive axle vehicles will be tested in one axle drive mode of operation. Full time multiple drive axle vehicles will have all but one axle temporarily disengaged by the vehicle manufacturer. Multiple drive axle vehicles which can be manually shifted to a one axle drive mode will be tested in the one axle drive mode of operation, unless this would pose a safety hazard, in which case all but one axle will be temporarily disengaged by the vehicle manufacturer.

§ 86.1236–85 Engine starting and restarting.

(a) Starting: (1) The engine shall be started (includinding choke operation) accaording to the manufacturers recommended starting procedures in the owner's manual. The initial idle period shall begin when the engine starts.

(2) The operator may use the choke, accelerator pedal, etc., where necessary to keep the engine running.

(3) If the manufacturer's operating instructions in the owner's manual do not specify a warm engine starting procedure, the engine shall be started by depressing the accelerator pedal about half way and cranking the engine until it starts.

(4) If the vehicle does not start after 10 seconds of cranking, cranking shall cease and the reason for failure to start shall be determined. If failure to start is an operational error, the vehicle shall be rescheduled for the running loss test. If failure to start is caused by a vehicle malfunction, corrective action of less than 30 minutes duration may be taken, and the test continued. When the engine starts, the driving schedule timing sequence shall begin. If failure to start is caused by vehicle malfunction and the vehicle cannot be started, the test shall be voided, the vehicle removed from the dynamometer, and corrective action may be taken. The reasons for the malfunction (if determined) and the

corrective action taken shall be recorded.

(b) *Stalling:* (1) If the engine stalls during an idle period, the engine shall be restarted immediately and the driving schedule continued. If the engine cannot be started soon enough to allow the vehicle to follow the next acceleration as prescribed, the driving schedule indicator shall be stopped. When the vehicle restarts, the driving schedule indicator shall be reactivated.

(2) If the engine stalls during some operating mode other than idle, the driving schedule indicator shall be stopped, the vehicle shall then be restarted and accelerated to the speed required at that point in the driving schedule and the driving schedule continued. During acceleration to this point, shifting shall be performed in accordance with § 86.1228–85.

(3) If the vehicle will not restart within one minute, the test shall be voided, the vehicle removed from the dynamometer, corrective action taken, and the vehicle rescheduled for testing. The reason for the malfunction (if determined) and the corrective action taken shall be recorded.

§ 86.1237–85 Dynamometer runs.

(a) The vehicle shall be either driven or pushed onto the dynamometer; however, if driven, the period of engine operation between the end of the diurnal loss test and beginning of the hot soak preparation run shall not exceed 3 minutes, and the vehicle shall be driven at minimum throttle. The dynamometer run shall follow the diurnal heat build by not more than one hour. The vehicle shall be stored prior to dynamometer operation in such a manner that it is not exposed to precipitation (e.g., rain or dew).

(b) The following steps shall be taken for the dynamometer run:

(1) Place drive wheels of vehicle on the dynamometer.

(2) Position the cooling fan(s).

(3) Attach an exhaust tube to the vehicle tailpipe(s).

(4) Start the engine.

(5) Turn on the cooling fan (s).

(6) Operate the vehicle according to the dynamometer driving schedule (§ 86.1215–85).

(7) At the end of the last deceleration, disconnect the exhaust tube from the vehicle tailpipe(s) and drive vehicle from the dynamometer.

§ 86.1238–85 Hot soak test.

The one-hour hot-soak evaporative emission test shall be conducted immediately following one cycle of the dynamometer driving schedule.

(a) Prior to the completion of the dynamometer cycle, the evaporative emission enclosure shall be purged for several minutes.

(b) The FID hydrocarbon analyzer shall be zeroed and spanned immediately prior to the test.

(c) If not already on, the evaporative enclosure mixing fan(s) shall be turned on at this time.

(d) Upon completion of the dynamometer run the exhaust tube shall be disconnected from the vehicle tailpipe(s), the cooling fan(s) shall be moved, and the vehicle shall be disconnected from the dynamometer and driven at minimum throttle to the vehicle entrance of the enclosure.

(e) The vehicle's engine must be stopped before any part of the vehicle enters the enclosure. The vehicle may be pushed or coasted into the enclosure.

(f) The test vehicle windows and any storage compartments shall be opened, if not already open.

(g) The temperature recording system shall be started and the time of engine shut off shall be noted on the evaporative emissions hydrocarbon data recording system.

(h) The enclosure doors shall be closed and sealed within four minutes of engine shutdown and within ten minutes after the end of the dynamometer run.

(i) The 60±0.5 minute hot soak begins when the enclosure doors are sealed. The enclosure atmosphere shall be analyzed and recorded. This is the initial (time=0 minutes) hydrocarbon concentration, C_{HCi}, for use in calculating evaporative losses, (see § 86.1243–85).

(j) The test vehicle shall be permitted to soak for a period of one hour in the enclosure.

(k) The FID hydrocarbon analyzer shall be zeroed and spanned immediately prior to the end of the test.

(l) At the end of the 60±0.5 minute test period, the enclosure atmosphere shall again be analyzed and the time recorded. This is the final (time=60 minutes) hydrocarbon concentration, C_{HCf}, for use in calculating evaporative losses, (see § 86.1243–85). This operation completes the evaporative emission measurement procedure.

§ 86.1239 [Reserved]

§ 86.1240 [Reserved]

§ 86.1241 [Reserved]

§ 86.1242–85 Records required.

The following information shall be recorded with respect to each test:

(a) Test number.

(b) System or device tested (brief description).

(c) Date and time of day for each part of the test schedule.

(d) Instrument operator.

(e) Driver or operator.

(f) Vehicle: ID number; Manufacturer; Model Year; Engine family; Evaporative emissions family; Basic engine description (including displacement, number of cylinders, and catalyst usage); Engine maximum power rating and rated speed; Fuel system (including number of carburetors, number of carburetor barrels, fuel injection type, fuel tank(s) capacity and location, and number and size (volume and working capacity) of evaporative control canisters, Engine code; Gross vehicle weight rating; Actual curb weight at zero miles; Actual road load at 50 mph; Transmission configuration; Axle ratio; Vehicle line; Odometer reading; Idle rpm; and Drive wheel tire pressure, as applicable.

(g) Indicated road load power absorption at 50 mph (80 km/hr) and dynamometer serial number. As an alternative to recording the dynamometer serial number, a reference to a vehicle test cell number may be used, provided the test cell records show the pertinent information.

(h) All pertinent instrument information such as tuning, gain, serial number, detector number and range. As an alternative, a reference to a vehicle test cell number may be used, with the advance approval of the Administrator, provided test cell calibration records show the pertinent instrument information.

(i) Recorder charts: Identify zero, span and enclosure gas sample traces.

(j) Test cell barometric pressure and ambient temperature.

Note.—A central laboratory barometer may be used: *Provided*, That individual test cell barometric pressures are shown to be within ±0.1 percent of the barometric pressure at the central barometer location.

(k) Fuel temperatures as prescribed.

§ 86.1243–85 Calculations; evaporative emissions.

The calculation of the net hydrocarbon mass change in the enclosure is used to determine the diurnal and hot-soak mass emissions. The mass is calculated from initial and final hydrocarbon concentrations in ppm carbon, initial and final enclosure ambient temperatures, initial and final barometric pressures, and net enclosure volume using the following equation:

$$M_{HC} = kV_e \times 10^{-4} \left(\frac{C_{HCf} P_{Bf}}{T_f} - \frac{C_{HCi} P_{Bi}}{T_i} \right)$$

Where:
M_{HC} = Hydrocarbon mass, g.
C_{HC} = Hydrocarbon concentration as ppm carbon.
V_n = Net enclosure volume ft³ (m³) as determined by subtracting 100 ft³ (2.84 m³) (volume of vehicle with windows and any storage compartments open) from the enclosure volume. A manufacturer may use the measured volume of the vehicle (instead of the nominal 100 ft³) provided the measured volume is determined and used for all vehicles tested by that manufacturer.
P_b = barometric pressure, in. Hg (kPa).
T = enclosure ambient temperature, R (K).
k = .208 (12+H/C); for SI units, k = 1.2 (12+H/C)
Where:
H/C = Hydrogen-carbon ratio.
H/C = 2.33 for diurnal emissions.
H/C = 2.2 for hot soak emissions.
i = Indicates initial reading.
f = Indicates final reading.

The final recorded results shall be computed by summing the individual evaporative emissions results determined for the diurnal breathing loss test, running loss test, and the hot soak test.

§ 86.1244 [Reserved]

§ 86.1245 [Reserved]

Authority: Section 202, 206, 301 of the Clean Air Act as amended, 42 U.S.C. 7521, 7525, 7601.

2. Appendix I of Part 86, is amended by adding a new paragraph (d) to read as follows:

Appendix I—Urban Dynamometer Driving Schedules

* * * * *

(d) EPA Urban Dynamometer Driving Schedule for Heavy-Duty Vehicles.

SPEED VERSUS TIME SEQUENCE

Record (sec)	Speed (mph)
0	0.0
1	0.0
2	0.0
3	0.0
4	0.0
5	0.0
6	0.0
7	0.0
8	0.0
9	0.0
10	0.0
11	0.0
12	0.0
13	0.0
14	0.0
15	0.0
16	0.0
17	0.0
18	0.0
19	0.0
20	0.0
21	0.0
22	0.0
23	0.0
24	0.0
25	0.19
26	1.00
27	1.51
28	2.65
29	4.64
30	6.96
31	8.86
32	7.71
33	7.45
34	9.22
35	10.00
36	9.08
37	10.08
38	11.24
39	12.79
40	14.00
41	12.58
42	12.87
43	13.00
44	13.00
45	13.68
46	15.00
47	15.00
48	13.37
49	12.08
50	12.26
51	14.29
52	14.56
53	15.20
54	16.76
55	17.00
56	17.00
57	17.23
58	18.77
59	20.54
60	19.60
61	18.14
62	17.98
63	17.00
64	16.34
65	15.00
66	15.00
67	15.00
68	15.96
69	12.35
70	15.26
71	14.27
72	12.59
73	12.25
74	9.28
75	8.00
76	8.00
77	8.38
78	9.53
79	10.69
80	11.00
81	9.00
82	9.00
83	9.32
84	10.00
85	9.36
86	9.00
87	9.95
88	14.33
89	17.53
90	19.42
91	20.00
92	20.74
93	21.00
94	21.11
95	23.84
96	27.00
97	27.00
98	29.05
99	32.52
100	31.01
101	31.00
102	31.62
103	33.00
104	32.37
105	30.43
106	30.00
107	30.00
108	30.51
109	32.41
110	33.00
111	32.27
112	32.00
113	31.04
114	32.20
115	33.36
116	34.00
117	34.00
118	34.00
119	33.01
120	31.86
121	30.10
122	26.17
123	23.39
124	21.46
125	17.28
126	15.83
127	13.76
128	12.60
129	10.33
130	8.28
131	5.38
132	2.91
133	0.0
134	0.0
135	0.0
136	0.0
137	0.0
138	0.0
139	0.0
140	0.0
141	0.0
142	0.0
143	0.0
144	0.0
145	0.0
146	0.0
147	0.0
148	0.0
149	0.0
150	0.0
151	0.0
152	0.0
153	0.0
154	0.0
155	0.0
156	0.0
157	0.0
158	0.0
159	0.0
160	0.0
161	0.0
162	0.0
163	0.0
164	0.0
165	0.0
166	0.0
167	0.0
168	0.0
169	0.0
170	0.0
171	0.0
172	0.0
173	0.0
174	0.51
175	0.33
176	0.0
177	0.0
178	0.0
179	0.0
180	0.0
181	0.0
182	0.0
183	0.0
184	0.0
185	0.0
186	0.0
187	0.0
188	0.0
189	0.0
190	0.0
191	0.0
192	0.0
193	0.0
194	0.0
195	0.0
196	0.0
197	0.13
198	0.71
199	0.0
200	0.0
201	0.0
202	0.0
203	4.15
204	6.00
205	6.00
206	6.00
207	5.30
208	4.14
209	1.96
210	0.0
211	0.0

SPEED VERSUS TIME SEQUENCE—Continued

Record (sec)	Speed (mph)
212	0.0
213	0.0
214	0.0
215	0.0
216	0.0
217	0.0
218	0.0
219	0.0
220	0.0
221	0.0
222	0.0
223	0.0
224	0.0
225	0.0
226	0.0
227	0.0
228	0.0
229	0.0
230	0.0
231	0.48
232	1.64
233	0.41
234	0.0
235	0.0
236	0.0
237	0.0
238	0.0
239	0.0
240	0.0
241	0.0
242	0.0
243	0.0
244	0.0
245	0.0
246	0.0
247	0.0
248	0.0
249	0.0
250	0.0
251	0.0
252	0.0
253	0.0
254	0.0
255	0.0
256	0.0
257	0.0
258	0.0
259	0.0
260	0.0
261	0.0
262	0.0
263	0.0
264	0.0
265	0.0
266	0.0
267	0.0
268	0.0
269	0.0
270	0.0
271	0.0
272	0.0
273	0.0
274	0.0
275	0.0
276	0.0
277	0.0
278	0.0
279	0.0
280	0.0
281	0.0
282	0.0
283	0.0
284	0.0
285	0.0
286	0.0
287	0.0
288	0.0
289	0.0
290	0.0
291	0.0
292	0.0
293	0.0
294	0.0
295	0.0
296	0.0
297	0.0
298	0.0
299	0.0
300	0.24
301	0.60
302	0.0

SPEED VERSUS TIME SEQUENCE—Continued

Record (sec)	Speed (mph)
303	1.42
304	2.00
305	3.08
306	5.63
307	4.00
308	4.00
309	3.34
310	1.37
311	1.00
312	0.0
313	0.0
314	0.0
315	0.0
316	0.0
317	0.0
318	0.0
319	0.23
320	1.39
321	2.00
322	4.11
323	5.00
324	6.02
325	7.16
326	7.33
327	6.49
328	7.00
329	7.00
330	7.00
331	7.00
332	7.00
333	7.43
334	8.00
335	8.00
336	7.09
337	11.06
338	12.89
339	14.49
340	11.46
341	13.08
342	16.55
343	16.00
344	15.34
345	12.32
346	13.00
347	13.00
348	13.00
349	15.86
350	12.00
351	11.73
352	11.00
353	11.00
354	11.00
355	11.90
356	12.89
357	10.36
358	7.26
359	4.95
360	4.68
361	6.68
362	8.00
363	7.84
364	7.00
365	6.53
366	7.89
367	10.57
368	11.00
369	10.10
370	10.74
371	10.42
372	11.00
373	12.46
374	14.77
375	14.09
376	16.20
377	17.00
378	17.00
379	17.00
380	17.00
381	15.02
382	15.71
383	14.00
384	14.92
385	15.38
386	15.78
387	16.00
388	16.00
389	16.25
390	17.41
391	18.56
392	19.00
393	19.88

SPEED VERSUS TIME SEQUENCE—Continued

Record (sec)	Speed (mph)
394	21.00
395	21.00
396	21.00
397	20.49
398	20.00
399	19.18
400	19.00
401	18.86
402	18.29
403	19.00
404	19.61
405	20.00
406	20.00
407	20.00
408	20.00
409	20.00
410	19.45
411	20.42
412	21.87
413	20.97
414	20.37
415	22.00
416	22.00
417	22.66
418	23.00
419	23.97
420	25.51
421	29.00
422	29.00
423	29.00
424	30.51
425	31.00
426	30.00
427	30.00
428	30.00
429	30.54
430	31.00
431	31.86
432	31.00
433	31.17
434	32.33
435	33.00
436	33.00
437	33.80
438	34.00
439	35.12
440	36.00
441	36.00
442	34.82
443	33.25
444	32.09
445	32.00
446	32.00
447	32.00
448	32.00
449	32.00
450	32.85
451	33.01
452	34.00
453	33.68
454	32.52
455	32.00
456	32.00
457	32.95
458	33.00
459	33.00
460	33.42
461	34.00
462	34.74
463	35.00
464	35.00
465	35.00
466	35.00
467	35.00
468	35.00
469	35.84
470	37.99
471	38.00
472	37.69
473	38.41
474	39.37
475	39.00
476	39.00
477	38.10
478	39.00
479	39.41
480	40.57
481	41.73
482	42.00
483	41.92
484	40.00

SPEED VERSUS TIME SEQUENCE—Continued

Record (sec)	Speed (mph)
485	40.00
486	39.48
487	37.66
488	37.00
489	36.01
490	34.88
491	33.70
492	32.54
493	29.54
494	26.46
495	22.26
496	19.91
497	18.76
498	17.60
499	16.44
500	14.57
501	13.13
502	11.97
503	10.81
504	9.31
505	7.50
506	6.34
507	4.37
508	3.03
509	1.87
510	0.71
511	0.0
512	0.0
513	0.0
514	0.0
515	0.0
516	0.0
517	0.0
518	0.0
519	0.0
520	0.0
521	0.0
522	0.0
523	0.0
524	0.0
525	0.0
526	0.0
527	0.0
528	0.0
529	0.0
530	0.0
531	0.0
532	0.0
533	0.0
534	0.0
535	0.0
536	0.0
537	0.0
538	0.0
539	0.0
540	0.0
541	0.0
542	0.0
543	0.0
544	2.36
545	3.94
546	5.31
547	8.26
548	9.42
549	11.15
550	12.73
551	14.78
552	16.05
553	17.41
554	19.72
555	21.52
556	23.35
557	24.83
558	25.99
559	27.15
560	29.31
561	29.46
562	30.62
563	31.78
564	32.94
565	34.18
566	36.25
567	37.41
568	38.56
569	39.72
570	40.00
571	40.00
572	40.00
573	40.00
574	40.00
575	40.00

SPEED VERSUS TIME SEQUENCE—Continued

Record (sec)	Speed (mph)
576	40.82
577	41.00
578	41.00
579	41.30
580	42.00
581	42.00
582	42.00
583	42.93
584	43.00
585	43.00
586	43.00
587	43.56
588	44.71
589	45.00
590	44.97
591	44.18
592	44.66
593	44.00
594	44.00
595	44.81
596	45.00
597	45.00
598	45.00
599	45.44
600	46.00
601	46.00
602	46.92
603	47.00
604	47.00
605	47.00
606	47.00
607	47.00
608	47.00
609	47.04
610	49.00
611	49.33
612	49.51
613	49.00
614	49.00
615	49.00
616	49.00
617	48.72
618	48.87
619	50.00
620	50.00
621	50.00
622	50.00
623	49.78
624	49.00
625	49.00
626	49.89
627	50.00
628	50.00
629	50.00
630	49.68
631	49.00
632	49.00
633	48.20
634	48.00
635	48.00
636	48.27
637	49.00
638	49.58
639	50.00
640	50.00
641	50.00
642	50.00
643	50.00
644	50.00
645	50.00
646	50.00
647	50.00
648	50.00
649	50.00
650	50.47
651	51.00
652	51.00
653	51.00
654	51.00
655	51.00
656	51.42
657	52.00
658	52.00
659	52.00
660	52.00
661	52.20
662	53.00
663	53.00
664	53.00
665	53.00
666	53.00

SPEED VERSUS TIME SEQUENCE—Continued

Record (sec)	Speed (mph)
667	53.00
668	53.00
669	53.00
670	52.38
671	52.00
672	52.93
673	52.91
674	52.25
675	53.00
676	53.00
677	53.00
678	53.00
679	53.00
680	53.00
681	53.00
682	53.00
683	53.00
684	53.00
685	53.98
686	55.00
687	55.00
688	55.00
689	55.00
690	55.00
691	55.00
692	55.00
693	56.00
694	55.00
695	55.00
696	55.00
697	55.00
698	55.00
699	55.00
700	55.00
701	54.50
702	54.66
703	55.00
704	54.03
705	54.00
706	54.00
707	54.00
708	54.00
709	54.00
710	54.00
711	54.00
712	54.00
713	54.77
714	56.00
715	56.00
716	56.00
717	56.02
718	57.00
719	56.67
720	56.00
721	56.00
722	56.00
723	56.00
724	56.00
725	56.00
726	56.00
727	56.00
728	56.00
729	56.91
730	57.00
731	57.00
732	57.00
733	57.00
734	57.00
735	57.85
736	58.00
737	58.00
738	58.00
739	58.00
740	58.00
741	58.00
742	58.00
743	58.00
744	58.00
745	57.15
746	56.00
747	56.00
748	56.00
749	56.00
750	56.00
751	55.63
752	55.00
753	55.00
754	55.00
755	55.00
756	55.00
757	55.00

SPEED VERSUS TIME SEQUENCE—Continued

Record (sec)	Speed (mph)
758	55.00
759	55.00
760	54.22
761	54.00
762	54.00
763	54.00
764	54.00
765	54.00
766	54.00
767	54.00
768	54.00
769	54.00
770	54.00
771	54.00
772	54.00
773	54.00
774	53.01
775	50.86
776	49.70
777	48.54
778	47.39
779	46.23
780	45.07
781	43.91
782	42.51
783	40.60
784	39.44
785	38.28
786	37.13
787	35.94
788	33.81
789	32.66
790	30.50
791	28.34
792	26.37
793	25.03
794	21.87
795	19.85
796	16.56
797	15.40
798	14.24
799	12.17
800	10.71
801	6.08
802	2.61
803	1.45
804	0.30
805	0.0
806	0.0
807	0.0
808	0.0
809	0.0
810	0.0
811	0.0
812	0.0
813	0.0
814	0.0
815	0.0
816	0.0
817	0.0
818	0.0
819	0.0
820	0.0
821	0.0
822	0.0
823	0.0
824	0.0
825	0.0
826	0.0
827	0.0
828	0.0
829	0.0
830	0.0
831	0.19
832	1.00
833	1.51
834	2.66
835	4.64
836	6.98
837	8.86
838	7.71
839	7.45
840	9.22
841	10.00
842	9.08
843	10.08
844	11.24
845	12.79
846	14.00
847	12.58
848	12.87

SPEED VERSUS TIME SEQUENCE—Continued

Record (sec)	Speed (mph)
849	13.00
850	13.00
851	13.68
852	15.00
853	15.00
854	13.37
855	12.03
856	12.26
857	14.29
858	14.56
859	15.20
860	16.76
861	17.00
862	17.00
863	17.23
864	18.77
865	20.54
866	19.60
867	18.14
868	17.98
869	17.00
870	16.34
871	15.00
872	15.00
873	15.00
874	15.96
875	12.35
876	15.28
877	14.27
878	12.59
879	12.25
880	9.28
881	8.00
882	8.00
883	8.38
884	9.53
885	10.69
886	11.00
887	9.00
888	9.00
889	9.32
890	10.00
891	9.36
892	9.00
893	9.95
894	14.33
895	17.53
896	19.42
897	20.00
898	20.74
899	21.00
900	21.11
901	23.84
902	27.00
903	27.00
904	29.05
905	32.52
906	31.01
907	31.00
908	31.62
909	33.00
910	32.37
911	30.43
912	30.00
913	30.00
914	30.51
915	32.41
916	33.00
917	32.27
918	32.00
919	31.04
920	32.20
921	33.36
922	34.00
923	34.00
924	34.00
925	33.01
926	31.86
927	30.10
928	26.17
929	23.39
930	21.46
931	17.28
932	15.83
933	13.76
934	12.60
935	10.33
936	8.28
937	5.38
938	2.91
939	0.0

SPEED VERSUS TIME SEQUENCE—Continued

Record (sec)	Speed (mph)
940	0.0
941	0.0
942	0.0
943	0.0
944	0.0
945	0.0
946	0.0
947	0.0
948	0.0
949	0.0
950	0.0
951	0.0
952	0.0
953	0.0
954	0.0
955	0.0
956	0.0
957	0.0
958	0.0
959	0.0
960	0.0
961	0.0
962	0.0
963	0.0
964	0.0
965	0.0
966	0.0
967	0.0
968	0.0
969	0.0
970	0.0
971	0.0
972	0.0
973	0.0
974	0.0
975	0.0
976	0.0
977	0.0
978	0.0
979	0.0
980	0.51
981	0.33
982	0.0
983	0.0
984	0.0
985	0.0
986	0.0
987	0.0
988	0.0
989	0.0
990	0.0
991	0.0
992	0.0
993	0.0
994	0.0
995	0.0
996	0.0
997	0.0
998	0.0
999	0.0
1000	0.0
1001	0.0
1002	0.0
1003	0.13
1004	0.71
1005	0.0
1006	0.0
1007	0.0
1008	0.0
1009	4.15
1010	6.00
1011	6.00
1012	6.00
1013	5.30
1014	4.14
1015	1.96
1016	0.0
1017	0.0
1018	0.0
1019	0.0
1020	0.0
1021	0.0
1022	0.0
1023	0.0
1024	0.0
1025	0.0
1026	0.0
1027	0.0
1028	0.0
1029	0.0
1030	0.0

SPEED VERSUS TIME SEQUENCE—Continued

Record (sec)	Speed (mph)
1031	0.0
1032	0.0
1033	0.0
1034	0.0
1035	0.0
1036	0.0
1037	0.48
1038	1.64
1039	0.41
1040	0.0
1041	0.0

SPEED VERSUS TIME SEQUENCE—Continued

Record (sec)	Speed (mph)
1042	0.0
1043	0.0
1044	0.0
1045	0.0
1046	0.0
1047	0.0
1048	0.0
1049	0.0
1050	0.0
1051	0.0
1052	0.0

SPEED VERSUS TIME SEQUENCE—Continued

Record (sec)	Speed (mph)
1053	0.0
1054	0.0
1055	0.0
1056	0.0
1057	0.0
1058	0.0
1059	0.0
1060	0.0

[FR Doc. 83-199 Filed 1-11-83; 8:45 am]
BILLING CODE 6560-50-M